



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

# Lachlan CMA region

**Part E**



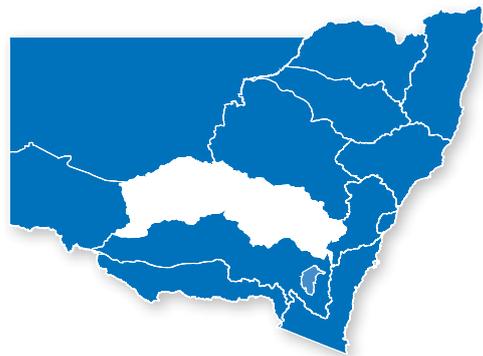


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## E1. INTRODUCTION

This is one of the 13 regional documents that sit under the *Biodiversity priorities for widespread weeds – statewide framework*. It provides information for the Lachlan Catchment Management Authority (Lachlan 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*, documents 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 E) establishes regional priorities, in the form of priority widespread weeds and priority sites for control, in the Lachlan CMA region.

The Lachlan CMA region is located in central western New South Wales, surrounded by the Macquarie and Bogan catchments to the north, Darling to the west, Murrumbidgee to the south and the Sydney/Shoalhaven Basin to the east. It covers an area of approximately 84,700 square kilometres and is responsible for 14% of the state's agricultural production. The Lachlan River rises near Gunning and terminates in the Great Cumbung Swamp near Oxley, 1,450 kilometres downstream to the west (Lachlan CMA 2009). This region comprises tablelands, slopes and plains areas and supports a great diversity of flora and fauna including over 1,579 vascular plants in 114 plant communities. Vegetation types include forests, woodlands, mallee, riverine communities, shrublands, heaths and grasslands. The landscape spans from temperate forests, woodlands and grasslands in the east to semi arid woodlands, mallee and shrublands in the west (Lachlan CMA 2009).

Invasive plants and animals are recognised as a key threat to the sustainability of the region's natural resources along with pressures posed by land clearing, climate change, groundwater extraction and altered flow regimes. A review of the impact of weeds on threatened biodiversity in New South Wales (i.e. species, populations and communities listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act)) indicated that 54 weeds in the Lachlan CMA region were threatening biodiversity, including at least 27 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 Lachlan 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 Lachlan 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 Lachlan 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.

## E2. REGIONAL CONTEXT

This section summarises the strategies, policies and programs relevant to weed management in the Lachlan 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*.

### E2.1 Catchment Action Plan

Under the NSW *Catchment Management Authorities Act 2003*, each CMA is required to prepare a CAP that outlines future priorities for the specific CMA and provides a co-ordinated plan for natural resource work in the region over a 10-year period. The Lachlan CMA CAP outlines resource condition targets under four themes: (i) biodiversity and native vegetation, (ii) water and aquatic ecosystems, (iii) land management and (iv) people and community. A series of management targets for each resource condition target illustrates how the CMA will invest in and measure progress towards natural resource management (Lachlan CMA 2006).

By identifying and prioritising biodiversity at risk from weeds in the Lachlan CMA region, as well as identifying priority sites for control, this project will help Lachlan CMA address four key management targets in the Lachlan CAP (Lachlan CMA 2006):

#### Catchment Target CT1

Aim: By 2016, there is an increase of 145,000 ha of terrestrial native vegetation that is being actively managed for biodiversity conservation.

##### » Management Target MT1

Aim: By 2016, 20,000 ha of terrestrial native vegetation managed for biodiversity conservation in perpetuity.

##### » Management Target MT2

Aim: By 2016, 100,000 ha of terrestrial native vegetation are actively managed for biodiversity conservation through management agreements.

#### Catchment Target CT2

Aim: By 2016, the highest priority terrestrial and aquatic threatened flora and fauna species, endangered populations and significant species will be managed for conservation.

##### » Management Target MT9

Aim: By 2016, maintain and improve the populations and diversity of 25 threatened flora and fauna species and/or endangered populations.

#### Catchment Target CT3

Aim: By 2016, restrict the extent of priority pest animals and environmental weeds.

##### » Management Target MT11

Aim: By 2010, an Integrated Weed Management Strategy will be developed. By 2016, priority actions identified in the Integrated Weed Management Strategy will be implemented.

## E2.2 Lachlan Integrated Weed Management Strategy

The Lachlan Integrated Weed Management Strategy was due for completion in 2010 by the Lachlan CMA as a key management target in the CAP (see E2.1). Priority actions of the Strategy are scheduled to be implemented by 2016 and ultimately aid in restricting the extent of priority pest animals and environmental weeds. This project will inform the development of the Lachlan Integrated Weed Management Strategy.

## E2.3 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)).

The committees relevant to Lachlan CMA region include:

- » Macquarie Valley Weeds Advisory Committee
- » Lachlan Valley Weeds Advisory Committee
- » Western Riverina Noxious Weeds Advisory Group

Regional weed management plans are developed by these regional weeds advisory committees to target specific 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.

## E2.4 Office of Environment & Heritage (OEH) regional pest management strategies

Within the Lachlan CMA region, the NPWS (part of OEH) administers significant land for conservation purposes. Weed management priorities on NPWS estate are currently 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.

There is one strategy relevant to the Lachlan CMA region: the Western Rivers Region Pest Management Strategy (see [www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm](http://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*).

## E2.5 Priorities Action Statement (PAS)

In accordance with the TSC Act, the 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 10 actions in the PAS relevant to weed management in the Lachlan CMA region (Appendix E1). These actions apply to a range of threatened species and one Endangered Ecological Community (EEC), the Fuzzy Box Woodlands. Blackberry (*Rubus fruticosus* agg.) is the only weed mentioned specifically in the PAS that is relevant in this region and this reference relates to its obstruction of cave entrances inhabited by a vulnerable bat species. Other weeds mentioned are not relevant as they do not occur in the Lachlan CMA region (e.g. lantana (*Lantana camara*)).

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

## E3. REGIONAL OUTPUTS

### E3.1 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 national *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 Lachlan 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*.

#### E3.1.1 Workshops in Lachlan CMA region

Two workshops were held in the Lachlan CMA region at Cowra and Condobolin on 15 and 17 of April 2008 respectively. Individuals from all local councils, relevant government departments, universities, landholders and community organisations were invited to attend. Representatives from NSW DPI, Lachlan CMA, Land and Property Management Authority, councils, Rural Lands Protection Boards (now the Livestock Health and Pest Authorities) and primary producers attended the workshops. See Appendix E2 for a full list of attendees.

#### E3.1.2 Lachlan CMA specific webpages

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

## E3.2 The process

### E3.2.1 Stage 1. Identifying weeds that pose a threat in the Lachlan CMA region

#### *A weeds dataset for the Lachlan 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* and the following documents:

- » Plants of NSW (Jacobs and Pickard 1981)
- » Weeds (Auld and Medd 1992)
- » Plants of Western NSW (Cunningham *et al.* 1981)

#### *Distribution of weeds within the Lachlan CMA region*

The list of weeds for the Lachlan CMA region was presented to workshop participants who were asked to identify which weeds they considered to be widespread. The weeds list considered at each workshop within the region is provided in Appendix E3.

#### *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 E1). Forty six widespread weeds were identified as having a high impact on biodiversity, which are the species that make up the final list of priority widespread weeds in the region (Table E2).

The impact of each widespread weed as determined at each workshop within the Lachlan CMA region is provided in Appendix E3.

*Table E1. Relative impact of widespread weeds on biodiversity.*

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 have relatively short life spans.

*Table E2. Priority widespread weeds impacting on biodiversity in the Lachlan CMA region (listed in alphabetical order).*

Scientific name (Common name)	KTP <sup>1</sup>	WoNS <sup>2</sup>	Noxious	
			NSW <sup>3</sup>	LGA <sup>4</sup>
<i>Ailanthus altissima</i> (tree of heaven)	Y*			Y
<i>Arctotheca calendula</i> (Capeweed)				
<i>Argemone ochroleuca</i> (Mexican poppy)			5	
<i>Asparagus asparagoides</i> (bridal creeper)	Y	Y	5	
<i>Bidens pilosa</i> (cobblers pegs, farmers friend)				
<i>Bidens subalternans</i> (large cobblers pegs, farmers friend)				
<i>Carduus nutans</i> (nodding thistle)				Y
<i>Carthamus lanatus</i> (saffron thistle)				
<i>Cenchrus</i> spp. (spiny burr grass)				Y

Scientific name (Common name)	KTP <sup>1</sup>	WoNS <sup>2</sup>	Noxious	
			NSW <sup>3</sup>	LGA <sup>4</sup>
<i>Cestrum parqui</i> (green cestrum)	Y*			Y
<i>Cirsium vulgare</i> (spear thistle)	Y*			
<i>Conium maculatum</i> (hemlock)				Y
<i>Cotoneaster glaucophyllus</i> (cotoneaster)				
<i>Crataegus monogyna</i> (hawthorn)	Y*			
<i>Cuscuta campestris</i> (golden dodder)				Y
<i>Cytisus scoparius</i> (Scotch broom, English broom)	Y			Y
<i>Datura stramonium</i> (thornapple)				
<i>Echium plantagineum</i> (Paterson's curse)	Y*			Y
<i>Echium vulgare</i> (viper's bugloss)	Y*			Y
<i>Eragrostis curvula</i> (African lovegrass)	Y			Y
<i>Euphorbia peplus</i> (petty spurge)				
<i>Foeniculum vulgare</i> (fennel)				
<i>Genista monspessulana</i> (Montpellier broom, Cape broom)				
<i>Hyparrhenia hirta</i> (Coolatai grass)	Y			Y
<i>Hypericum perforatum</i> (St John's wort)	Y*			Y
<i>Ligustrum lucidum</i> (large-leaf privet)	Y*			Y
<i>Ligustrum sinense</i> (small-leaf privet)	Y*			Y
<i>Lycium ferocissimum</i> (African boxthorn)	Y*			Y
<i>Marrubium vulgare</i> (horehound)	Y*			Y
<i>Nassella neesiana</i> (Chilean needle grass)	Y	Y		Y
<i>Nassella trichotoma</i> (serrated tussock)	Y	Y		Y
<i>Olea europaea</i> (olives)	Y			
<i>Phalaris aquatica</i> (phalaris)	Y			
<i>Phyla canescens</i> (lippia)	Y*		4	
<i>Pinus</i> spp. (pines)	Y*			
<i>Rosa rubiginosa</i> (sweet briar)	Y*			Y
<i>Rubus fruticosus</i> agg. (blackberry)	Y*	Y	4	
<i>Salix</i> spp. (willows)	Y*	Y	5	
<i>Sclerolaena birchii</i> (galvanised burr)				Y
<i>Senecio cunninghamii</i> (bushy groundsel)				
<i>Senna barclayana</i> (pepperleaf senna)				
<i>Sorghum halepense</i> (Johnson grass)				Y
<i>Ulex europaeus</i> (gorse)	Y*	Y		Y
<i>Vachellia</i> ( <i>Acacia farnesiana</i> ) (prickly acacia)				
<i>Xanthium occidentale</i> (Noogoora burr)				Y
<i>Xanthium spinosum</i> (Bathurst burr)				Y

KTP<sup>1</sup> = Weed listed under a Key Threatening Process in the TSC Act, as at 31 August 2010; WoNS<sup>2</sup> = Weeds of National Significance (Thorp and Lynch 2000); NSW<sup>3</sup> = All of New South Wales; LGA<sup>4</sup> = 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*.

### **E3.2.2 Stage 2. Identifying biodiversity at risk from high priority weeds**

At each workshop, participants were provided with lists of EECs and threatened species (as listed under the TSC Act and EPBC Act), as well as general vegetation types present in the Lachlan CMA region. They were asked to consider if any species 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 identifies EECs and vegetation communities that are considered under threat from the high priority weeds (Tables E3 and E4). In addition, information from the workshops was complemented by the surveys undertaken across NPWS estate in 2009–10 to establish biodiversity priorities for widespread weeds (see Section E2.4 of this document and Section 1.6.1 of the *statewide framework*). All of the above information was used to help guide site nominations (see E3.2.3, Stage 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.

#### *Impact of widespread weeds on EECs and vegetation communities*

The EEC impacted by the greatest number of high priority weeds was Box Gum Woodland (38 high priority weeds), followed by Natural Temperate Grassland of the Southern Tablelands (20 high priority weeds (Table E3)). The weeds posing the greatest threat in terms of number of EECs threatened were tree of heaven (*Ailanthus altissima*), Capeweed (*Arctotheca calendula*), Paterson's curse (*Echium plantagineum*), Coolatai grass (*Hyparrhenia hirta*), St John's wort (*Hypericum perforatum*), and horehound (*Marrubium vulgare*) (each affecting four EECs).

The general vegetation communities most affected by the high impact weeds were Riparian Areas (24 weeds impacting) and Tableland Woodlands (32 weeds impacting) (Table E4). African boxthorn (*Lycium ferocissimum*), Paterson's curse (*Echium plantagineum*) and Bathurst burr (*Xanthium spinosum*) impacted across the greatest number of general vegetation communities. In the tablelands and slopes areas St. John's wort (*Hypericum perforatum*) impacted on all vegetation types.

### **E3.2.3 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 Lachlan CMA project website to enable access for others. In order to capture high priority biodiversity sites on private lands, site nomination forms were also sent to all landholders with voluntary conservation agreements (VCA) and wildlife refuges with the NPWS in the Lachlan CMA region, along with a letter outlining the aims of the project (Appendix E4) and a list of priority weeds in the region as identified in Stage 1. In addition, during 2009–10 NPWS undertook a comprehensive survey of sites on NPWS estate.

### Categories for control

The 31 sites nominated to date (as at 31 August 2010) for the Lachlan CMA region were separated into six categories using the site ranking process outlined in Appendix 4 of the *statewide framework*. 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.

This process resulted in eight sites in Category 1 (Table E5). 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.

### A3.2.4 Review and additional site nominations

A draft of this report was provided to Lachlan CMA for comment and review on 10 July 2009. The draft report contained information on Stages 1 and 2, as well as the list of site nominations received before 31 December 2008. Summary information from site nominations was provided in the draft report to highlight any important assets or tenures that may have been missed in the initial site nomination process. In addition, site nominations received for NPWS estate were provided to the NPWS regions for comment and review.

Further site nominations were then sought and any nominations received from 2009 to August 2010 were included and then ranked. However, the site nomination process is ongoing and should be used by Lachlan CMA to identify additional regional priorities for weed control that are not already captured in this report. The complete list of priority sites for control will therefore be only held electronically and updated by the CMA.

Table E3. Endangered Ecological Communities (EECs) under threat from priority widespread weeds in the Lachlan CMA region.

Priority widespread weed	Endangered Ecological Community					
	Scientific name (Common name)	Fuzzy Box Woodland	Inland Grey Box Woodland	Myall Woodland	Box-Gum Woodland	Nelia Shrublands
<i>Ailanthus altissima</i> (tree of heaven)						
<i>Arctotheca calendula</i> (Capeweed)						
<i>Argemone ochroleuca</i> (Mexican poppy)						
<i>Asparagus asparagoides</i> (bridal creeper)						
<i>Bidens pilosa</i> (cobblers pegs, farmers friend)						
<i>Bidens subalternans</i> (large cobblers pegs, farmers friend)						
<i>Carduus nutans</i> (nodding thistle)						
<i>Carthamus lanatus</i> (saffron thistle)						
<i>Cenchrus</i> spp. (spiny burr grass)						
<i>Cestrum parqui</i> (green cestrum)						
<i>Cirsium vulgare</i> (spear thistle)						
<i>Conium maculatum</i> (hemlock)						

Priority widespread weed	Endangered Ecological Community					
	Fuzzy Box Woodland	Inland Grey Box Woodland	Myall Woodland	Box-Gum Woodland	Nelia Shrublands	Natural Temperate Grassland of the Southern Tablelands
<i>Cotoneaster glaucophyllus</i> (cotoneaster)						
<i>Crataegus monogyna</i> (hawthorn)						
<i>Cuscuta campestris</i> (golden dodder)						
<i>Cytisus scoparius</i> (Scotch broom, English broom)						
<i>Datura stramonium</i> (thornapple)						
<i>Echium plantagineum</i> (Paterson's curse)						
<i>Echium vulgare</i> (viper's bugloss)						
<i>Eragrostis curvula</i> (African lovegrass)						
<i>Euphorbia peplus</i> (petty spurge)						
<i>Foeniculum vulgare</i> (fennel)						
<i>Genista monspessulana</i> (Montpellier broom, Cape broom)						
<i>Hyparrhenia hirta</i> (Coolatai grass)						
<i>Hypericum perforatum</i> (St John's wort)						
<i>Ligustrum lucidum</i> (large-leaf privet)						
<i>Ligustrum sinense</i> (small-leaf privet)						
<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>Olea europaea</i> (olives)						
<i>Phalaris aquatica</i> (phalaris)						
<i>Phyla canescens</i> (lippia)						
<i>Pinus</i> spp. (pine)						
<i>Rosa rubiginosa</i> (sweet briar)						
<i>Rubus fruticosus</i> agg. (blackberry)						
<i>Salix</i> spp. (willows)						
<i>Sclerolaena birchii</i> (galvanised burr)						
<i>Senecio cunninghamii</i> (bushy groundsel)						
<i>Senna barclayana</i> (pepperleaf senna)						
<i>Sorghum halepense</i> (Johnson grass)						

Priority widespread weed	Endangered Ecological Community					
Scientific name (Common name)	Fuzzy Box Woodland	Inland Grey Box Woodland	Myall Woodland	Box-Gum Woodland	Nelia Shrublands	Natural Temperate Grassland of the Southern Tablelands
<i>Ulex europaeus</i> (gorse)						
<i>Vachellia</i> (Acacia) <i>farnesiana</i> (prickly acacia)						
<i>Xanthium occidentale</i> (Noogoora burr)						
<i>Xanthium spinosum</i> (Bathurst burr)						

Table E4. Vegetation communities under threat from widespread weeds in the Lachlan CMA region.

Priority widespread weed	Vegetation community														
Scientific name (Common name)	Tablelands Forest	Tablelands Woodland	Tablelands Grassland	Slopes Forest	Slopes Woodland	Slopes Grassland	Riparian Areas	Wetlands	Plains Woodland	Plains Shrubland	Plains Grassland	Semi Arid Woodland	Mallee*	Riverine Forest	Floodplain Woodland
<i>Ailanthus altissima</i> (tree of heaven)															
<i>Arctotheca calendula</i> (Capeweed)															
<i>Argemone ochroleuca</i> (Mexican poppy)															
<i>Asparagus asparagoides</i> (bridal creeper)															
<i>Bidens pilosa</i> (cobblers pegs, farmers friend)															
<i>Bidens subalternans</i> (large cobblers pegs, farmers friend)															
<i>Carduus nutans</i> (nodding thistle)															
<i>Carthamus lanatus</i> (saffron thistle)															
<i>Cenchrus</i> spp. (spiny burr grass)															
<i>Cestrum parqui</i> (green cestrum)															
<i>Cirsium vulgare</i> (spear thistle)															
<i>Conium maculatum</i> (hemlock)															
<i>Cotoneaster glaucophyllus</i> (cotoneaster)															
<i>Crataegus monogyna</i> (hawthorn)															
<i>Cuscuta campestris</i> (golden dodder)															
<i>Cytisus scoparius</i> (Scotch broom, English broom)															
<i>Datura stramonium</i> (thornapple)															
<i>Echium plantagineum</i> (Paterson's curse)															
<i>Echium vulgare</i> (viper's bugloss)															
<i>Eragrostis curvula</i> (African lovegrass)															
<i>Euphorbia peplus</i> (petty spurge)															
<i>Foeniculum vulgare</i> (fennel)															
<i>Genista monspessulana</i> (Montpellier broom, Cape broom)															
<i>Hyparrhenia hirta</i> (Coolatai grass)															

Priority widespread weed	Vegetation community														
Scientific name (Common name)	Tablelands Forest	Tablelands Woodland	Tablelands Grassland	Slopes Forest	Slopes Woodland	Slopes Grassland	Riparian Areas	Wetlands	Plains Woodland	Plains Shrubland	Plains Grassland	Semi Arid Woodland	Mallee*	Riverine Forest	Floodplain Woodland
<i>Hypericum perforatum</i> (St John's wort)															
<i>Ligustrum lucidum</i> (large-leaf privet)															
<i>Ligustrum sinense</i> (small-leaf privet)															
<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>Olea europaea</i> (olives)															
<i>Phalaris aquatica</i> (phalaris)															
<i>Phyla canescens</i> (lippia)															
<i>Pinus</i> spp. (pine)															
<i>Rosa rubiginosa</i> (sweet briar)															
<i>Rubus fruticosus</i> agg. (blackberry)															
<i>Salix</i> spp. (willows)															
<i>Sclerolaena birchii</i> (galvanised burr)															
<i>Senecio cunninghamii</i> (bushy groundsel)															
<i>Senna barclayana</i> (pepperleaf senna)															
<i>Sorghum halepense</i> (Johnson grass)															
<i>Ulex europaeus</i> (gorse)															
<i>Vachellia</i> ( <i>Acacia</i> ) <i>farnesiana</i> (prickly acacia)															
<i>Xanthium occidentale</i> (Noogoora burr)															
<i>Xanthium spinosum</i> (Bathurst burr)															

\*Listed as critically endangered EEC as at 24 Sep 2010, but was not listed at the time of the workshops.

Table E5. The number of sites in each of the six categories.

	Categories						Not valid <sup>^</sup>	Total
	1*	2	3	4	5	6		
Number of sites	8	0	2	8	3	0	10	31

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

<sup>^</sup> insufficient information was provided to reliably allocate these sites to a category.

## E4. SUMMARY FOR LACHLAN 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.

### E4.1 Meeting the NRC target for invasive species

Undertaking weed control 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 Lachlan CMA region, can also be used to meet a range of CMA priorities. This project directly addresses the Lachlan CMA CAP targets as outlined in Section E2.1, 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 Lachlan 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).

## **E4.2 Biodiversity conservation and widespread weed management**

The list of priority sites provides strategic direction for on-ground works by identifying areas where weed control 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 Lachlan 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 Lachlan 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*).

## **E4.3 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 Lachlan CMA region. As conditions or management requirements change at existing sites, and as information on sites becomes available, they can be included into the the Lachlan CMA site spreadsheet for subsequent re-ranking in the future (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.

The draft report for the Lachlan CMA region contained site nominations received before 31 December 2008. Any site nominations received from 2009 to 31 August 2010 were included and ranked in this final report. The low number of sites compiled to date indicates that further consultation of stakeholders is required, especially with regards to private landholders, to improve the robustness of this as a prioritisation tool in the Lachlan CMA region. Any additional site nominations or changes to existing nominations should be provided to the relevant contact within Lachlan CMA for inclusion in the site spreadsheet and sites should subsequently be re-ranked by Lachlan 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.

## E5. REFERENCES

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## **E6. APPENDICES**

Appendix E1: Current actions in the Priorities Action Statement (PAS) relating to weed management in the Lachlan CMA region

Appendix E2: Attendees at the Lachlan CMA region weed impacts to biodiversity workshops

Appendix E3: Weeds considered at the workshops in the Lachlan CMA region, their distribution and their relative impact on biodiversity

Appendix E4: Template of letter sent to private landholders with voluntary conservation agreements or wildlife refuges on their properties

**APPENDIX E1.  
CURRENT ACTIONS IN THE PRIORITIES ACTION STATEMENT (PAS)  
RELATING TO WEED MANAGEMENT IN THE LACHLAN CMA REGION**

Threatened species, populations and communities	Type of species	Level of threat	Priority actions in PAS relating to weed management
<b>High priority</b>			
<i>Anseranas semipalmata</i>	Birds	V	Promote and support weed control programs within wetlands.
<i>Eucalyptus saxicola</i>	Trees	E	Monitor and control weed invasion at the site.
<i>Lepidium aschersonii</i>	Herbs and Forbs	V	Conduct weed control and regeneration of the vegetative community.
<i>Pilularia novae-hollandiae</i>	Ferns and Cycads	E	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.
<b>Medium priority</b>			
<i>Austrostipa metatoris</i>	Herbs and Forbs	V	Conduct weed control at 5 selected sites and monitor benefit.
<i>Austrostipa wakoolica</i>	Herbs and Forbs	E	Conduct weed control at 5 selected sites and monitor benefit.
Fuzzy Box on alluvials of South West Slopes, Darling Riverine Plains and the Brigalow Belt	Threatened Ecological Communities	E	Encourage land managers to employ best management practice standards in controlling noxious weed or pest species in EECs.
<b>Low priority</b>			
<i>Miniopterus schreibersii oceanensis</i>	Bats	V	Undertake non-chemical removal of weeds (e.g. lantana, blackberry) to prevent obstruction of cave entrances.
<i>Syconycteris australis</i>	Bats	V	Control coastal weed species eg bitou bush, but avoid aerial spraying during the flowering season of important heath species as herbicides can directly collect in flowers that are fed upon at night.

Note: Although the species in this table are found in the Lachlan CMA region some actions listed above are not specific to Lachlan CMA.

V = listed as vulnerable under the TSC Act; E = listed as endangered under the TSC Act.

**APPENDIX E2.  
ATTENDEES AT THE LACHLAN CMA REGION WEED IMPACTS TO  
BIODIVERSITY WORKSHOPS**

Name	Organisation	Position
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Tuesday 15 April at Cowra

Angela Higgins	Lachlan CMA	Catchment Officer
Mick Mayoh	Private Landholder	
Paul Brown	Upper Lachlan Shire Council	Noxious Weeds Manager
Ken Williams	Private Landholder	
Maxine Williams	Private Landholder	
Pam Maloney	Private Landholder	
Kevin Nelligan	Cowra Shire Council	Noxious Weeds Supervisor
Michael Hayes	Young Livestock Health and Pest Authority	Ranger
Christian Wythes	Lachlan CMA	Catchment Officer
Tamsin Martin	Land and Property Management Authority	Team Leader Environment
Alicia Cohen	Land and Property Management Authority	Environmental Officer
Garry Germon	Lachlan CMA	Senior Project Officer

Thursday 17 April at Condobolin

Peter Walker	Land and Property Management Authority	Regional Manager
Neville Schrader	Private Landholder	
Allan Hutchison	Hay Livestock Health and Pest Authority	Director
John Duryea	Hay Livestock Health and Pest Authority	Senior Ranger
Matthew Bailey	Parkes Shire Council	Noxious Weeds Officer
Allan Dodgson	Lachlan Shire Council	Weeds Inspector
Robert Ferguson	Riverina Noxious Weeds Authority	Manager
Glenn Neyland	Bland Shire Council	
Angela Higgins	Lachlan CMA	Catchment Officer
Ray Mitchell	Carrathool Shire Council	Assistant Health & Building Surveyor
Kevin Woods	Carrathool Shire Council	Weeds Officer

**APPENDIX E3.  
WEEDS CONSIDERED AT THE WORKSHOPS IN THE LACHLAN CMA  
REGION, THEIR DISTRIBUTION AND THEIR RELATIVE IMPACT ON  
BIODIVERSITY**

Scientific name (Common name)	Cowra		Condobolin	
	D <sup>1</sup>	I <sup>2</sup>	D <sup>1</sup>	I <sup>2</sup>
<i>Acetosella vulgaris</i> (sheep sorrel)				
<i>Achillea millefolium</i> (milfoil)				
<i>Agrostis capillaris</i> (browntop bent grass)				
<i>Ailanthus altissima</i> (tree of heaven)	W	H	W	H
<i>Alternanthera pungens</i> (khaki weed)	W	M	W	M
<i>Amaranthus hybridus</i> (slim amaranth)				
<i>Amaranthus retroflexus</i> (redroot amaranth)				
<i>Ammi majus</i> (bishop's weed)	W	M	W	
<i>Amsinckia calycina</i> (yellow burr weed)				
<i>Amsinckia intermedia</i> (yellow burr weed)				
<i>Anagallis arvensis</i> (scarlet pimpernel)	W	L		
<i>Andropogon virginicus</i> (whisky grass)			W	M
<i>Anthemis cotula</i> (stinking mayweed)	W	M		
<i>Anthoxanthum odoratum</i> (sweet vernal grass)				
<i>Aphanes arvensis</i> (parsley piert)				
<i>Arctotheca calendula</i> (Capeweed)	W	H	W	M
<i>Argemone ochroleuca</i> (Mexican poppy)	W	H		
<i>Artemisia verlotiorum</i> (mugwort)				
<i>Asparagus asparagoides</i> * (bridal creeper)			W	H
<i>Asphodelus fistulosus</i> (onion weed)				
<i>Avena fatua</i> (wild oats)				
<i>Avena ludoviciana</i> (ludo wild oats)				
<i>Bidens pilosa</i> (cobblers pegs)	W	H	W	L
<i>Bidens subalternans</i> (large cobblers pegs)	W	H		
<i>Brassica juncea</i> (Indian mustard)	W	L		
<i>Brassica rapa</i> (wild turnip)				
<i>Brassica tournefortii</i> (wild turnip)				
<i>Briza maxima</i> (blowfly grass)				
<i>Briza minor</i> (shivery grass)				
<i>Bromus brevis</i> (prairie grass)				
<i>Bromus catharticus</i> (prairie grass)				
<i>Bromus diandrus</i> (rippgut brome)				
<i>Bromus molliformis</i> (soft brome)				
<i>Buglossoides arvensis</i> (corn gromwell)				
<i>Bursaria spinosa</i> (Australian blackthorn)				
<i>Capsella bursa-pastoris</i> (shepherd's purse)				
<i>Cardaria draba</i> (hoary cress)	W	M		
<i>Carduus nutans</i> (nodding thistle)	W	H		
<i>Carduus pycnocephalus</i> (slender thistle)				

Scientific name (Common name)	Cowra		Condobolin	
	D <sup>1</sup>	I <sup>2</sup>	D <sup>1</sup>	I <sup>2</sup>
<i>Carduus tenuiflorus</i> (winged slender thistle)				
<i>Carthamus lanatus</i> (saffron thistle)	W	L	W	H
<i>Cassinia arcuata</i> (sifton bush)				
<i>Cenchrus incertus</i> (spiny burr grass)	W	H	W	L
<i>Cenchrus longispinus</i> (spiny burr grass)	W	H	W	L
<i>Centaurea melitensis</i> (Maltese cockspur)				
<i>Centaurea solstitialis</i> (St. Barnaby's thistle)			W	L
<i>Centaurea calcitrapa</i> (star thistle)	W	L	W	L
<i>Centaurium erythraea</i> (common centaury)				
<i>Centaurium tenuiflorum</i> (branched centaury)	W	L		
<i>Cerastium glomeratum</i> (mouse-eared chickweed)				
<i>Cestrum parqui</i> (green cestrum)	W	H		
<i>Chamaecytisus palmensis</i> (lucerne tree)	W	L		
<i>Chenopodium album</i> (fat hen)	W	M		
<i>Chenopodium ambrosioides</i> (Mexican tea)				
<i>Chenopodium murale</i> (nettle-leaved goosefoot)				
<i>Chloris virgata</i> (feathertop Rhodes grass)				
<i>Chondrilla juncea</i> (skeleton weed)			W	L
<i>Cirsium vulgare</i> (spear thistle)	W	H	W	L
<i>Citrullus colocynthis</i> (colocynth)				
<i>Citrullus lanatus</i> (wild melon)	W	L		
<i>Conium maculatum</i> (hemlock)	W	H		
<i>Convolvulus arvensis</i> (field bindweed)			W	L
<i>Conyza bilbaoana</i> (fleabane)	W	L		
<i>Conyza bonariensis</i> (flax leaf fleabane)	W	L		
<i>Conyza canadensis</i> (Canadian fleabane)	W	L		
<i>Coreopsis lanceolata</i> (coreopsis)				
<i>Coronopus didymus</i> (lesser swinecress)				
<i>Cotoneaster franchetii</i> (cotoneaster)	W	H		
<i>Crataegus monogyna</i> (hawthorn)	W	H		
<i>Crepis capillaris</i> (smooth hawksbeard)				
<i>Crotalaria</i> spp. (rattlepods)				
<i>Cuscuta campestris</i> (golden dodder)			W	H
<i>Cynodon dactylon</i> (couch)	W	M	W	L
<i>Cyperus eragrostis</i> (umbrella sedge)	W	M		
<i>Cyperus rotundus</i> (nutgrass)	W	M		
<i>Cytisus scoparius</i> (Scotch broom)	W	H		
<i>Dactylis glomerata</i> (cocksfoot)	W	L		
<i>Datura ferox</i> (fierce thornapple)			W	L
<i>Datura stramonium</i> (thornapple)	W	H	W	L
<i>Daucus glochidiatus</i> (wild carrot)				
<i>Digitaria ciliaris</i> (crab grass)				

Scientific name (Common name)	Cowra		Condobolin	
	D <sup>1</sup>	I <sup>2</sup>	D <sup>1</sup>	I <sup>2</sup>
<i>Digitaria sanguinalis</i> (summer grass)				
<i>Dittrichia graveolens</i> (stinkwort)	W	L		
<i>Echinochloa crus-galli</i> (barnyard grass)				
<i>Echium plantagineum</i> (Paterson's curse)	W	H	W	H
<i>Echium vulgare</i> (viper's bugloss)	W	H		
<i>Eleusine indica</i> (crowsfoot grass)				
<i>Emex australis</i> (spiny emex, cats head)				
<i>Eragrostis cilianensis</i> (stinkgrass)				
<i>Eragrostis curvula</i> (African lovegrass)	W	H	W	L
<i>Erodium moschatum</i> (crowsfoot, storksbill)	W	L	W	L
<i>Euphorbia peplus</i> (petty spurge)	W	H		
<i>Foeniculum vulgare</i> (fennel)	W	H		
<i>Fumaria bastardii</i> (bastard's fumitory)				
<i>Genista monspessulana</i> (Montpellier broom)	W	H		
<i>Geranium molle</i> (dove's foot cranesbill)	W	M		
<i>Gleditsia triacanthos</i> (honey locust)				
<i>Heliotropium amplexicaule</i> (blue heliotrope)			W	L
<i>Hirschfeldia incana</i> (Buchan weed)	W	L		
<i>Holcus lanatus</i> (Yorkshire fog)	W	M		
<i>Hordeum hystrix</i> (barley grass)				
<i>Hyparrhenia hirta</i> (Coolatai grass)	W	H	W	L
<i>Hypericum perforatum</i> (St John's wort)	W	H	W	L
<i>Hypochaeris radicata</i> (flatweed, catsear)	W	M		
<i>Juncus acutus</i> (spiny rush)	W	L		
<i>Juncus articulatus</i> (jointed rush)				
<i>Lactuca serriola</i> (prickly lettuce)				
<i>Lamium amplexicaule</i> (deadnettle)				
<i>Lepidium africanum</i> (peppergrass)				
<i>Ligustrum lucidum</i> (large-leaf privet)	W	H		
<i>Ligustrum sinense</i> (small-leaf privet)	W	H		
<i>Lolium perenne</i> (perennial ryegrass)				
<i>Lolium rigidum</i> (annual ryegrass)				
<i>Lycium ferocissimum</i> (African boxthorn)	W	H	W	H
<i>Malva parviflora</i> (small-flowered mallow)				
<i>Marrubium vulgare</i> (horehound)	W	H	W	M
<i>Medicago</i> annual spp. (medics)				
<i>Medicago sativa</i> (lucerne)				
<i>Melilotus indicus</i> (Hexham scent)	W	L		
<i>Modiola caroliniana</i> (red flower mallow)				
<i>Nassella neesiana</i> (Chilean needle grass)	W	H		
<i>Nassella trichotoma</i> (serrated tussock)	W	H		
<i>Olea europaea</i> * (olive)	W	H		
<i>Onopordum acanthium</i> (Scotch thistle)	W	M		
<i>Onopordum illyricum</i> (Illyrian thistle)				

Scientific name (Common name)	Cowra		Condobolin	
	D <sup>1</sup>	I <sup>2</sup>	D <sup>1</sup>	I <sup>2</sup>
<i>Oxalis articulata</i> (shamrock oxalis)				
<i>Oxalis pes-caprae</i> (soursob)	W	L		
<i>Papaver aculeatum</i> (bristle poppy)				
<i>Papaver dubium</i> (long-head poppy)				
<i>Papaver hybridum</i> (rough poppy)				
<i>Papaver somniferum</i> (opium poppy)				
<i>Paspalum dilatatum</i> (paspalum)	W	M		
<i>Pavonia hastata</i> (pavonia)				
<i>Pennisetum villosum</i> (feather grass)				
<i>Phalaris aquatica</i> (phalaris)	W	H		
<i>Phyla canescens</i> (lippia)	W	H	W	H
<i>Pinus radiata</i> (pine)	W	H		
<i>Plantago lanceolata</i> (lamb's tongue)	W	M		
<i>Poa annua</i> (winter grass)				
<i>Poa labillardieri</i> (poa tussock)				
<i>Polygonum aviculare</i> (wireweed)	W	L		
<i>Portulaca oleracea</i> (purslane)			W	L
<i>Pyracantha fortuneana</i> (firethorn)	W	L		
<i>Ranunculus muricatus</i> (sharp buttercup)				
<i>Raphanus raphanistrum</i> (wild radish)				
<i>Rapistrum rugosum</i> (turnip weed)				
<i>Reseda lutea</i> (cut-leaf mignonette)	W	M		
<i>Reseda luteola</i> (wild mignonette)				
<i>Robinia pseudoacacia</i> (black locust)				
<i>Romulea rosea</i> (onion grass)				
<i>Rorippa nasturtium-aquatica</i> (watercress)	W	L		
<i>Rosa rubiginosa</i> (sweet briar)	W	H		
<i>Rubus fruticosus</i> agg. (blackberry)	W	H	W	
<i>Rumex crispus</i> (docks)	W	M	W	L
<i>Salix</i> spp. (willows)	W	H	W	L
<i>Salsola kali</i> (soft roly poly)			W	L
<i>Sclerolaena birchii</i> (galvanised burr)			W	H
<i>Sclerolaena muricata</i> (blackroly poly)			W	M
<i>Senecio cunninghamii</i> * (bushy groundsel)	W	L	W	L
<i>Senna barclayana</i> (pepperleaf senna)	W	H	W	H
<i>Setaria verticillata</i> (whorled pigeon grass)	W	M		
<i>Sida rhombifolia</i> (Paddy's lucerne)				
<i>Silybum marianum</i> (variegated thistle)	W	M		
<i>Sisymbrium irio</i> (London rocket)				
<i>Sisymbrium officinale</i> (hedge mustard)	W	L		
<i>Sisymbrium orientale</i> (Indian hedge mustard)				
<i>Solanum elaeagnifolium</i> (silver-leaf nightshade)	W	L	W	M

Scientific name (Common name)	Cowra		Condobolin	
	D <sup>1</sup>	I <sup>2</sup>	D <sup>1</sup>	I <sup>2</sup>
<i>Solanum nigrum</i> (blackberry nightshade)	W	L		
<i>Solanum triflorum</i> (three-flowered nightshade)				
<i>Soliva sessilis</i> (bindii)	W	L		
<i>Sonchus asper</i> (rough sowthistle)			W	M
<i>Sonchus oleraceus</i> (sowthistle)			W	M
<i>Sorghum halepense</i> (Johnson grass)	W	H	W	L
<i>Stachys arvensis</i> (stagger weed)				
<i>Stellaria media</i> (chickweed)	W	L		
<i>Taraxacum officinale</i> (dandelion)	W	L		
<i>Tribulus terrestris</i> (caltrop)	W	M	W	M
<i>Trifolium repens</i> (white clover)				
<i>Trifolium</i> spp. (annual clovers)	W	L		
<i>Ulex europaeus</i> (gorse)	W	H		
<i>Urochloa panicoides</i> (liverseed grass)				
<i>Urtica incisa</i> (scrub nettle)				
<i>Urtica urens</i> (stinging nettle)				
<i>Vachellia farnesiana</i> * (thorny acacia)			W	H
<i>Verbascum thapsus</i> (great mullein)				
<i>Verbascum virgatum</i> (twiggy mullein)				
<i>Verbena bonariensis</i> (purpletop)				
<i>Verbena officinalis</i> (common verbena)	W	L		
<i>Verbena rigida</i> (veined verbena)				
<i>Vicia hirsuta</i> (hairy vetch)	W	M		
<i>Vicia sativa</i> (common vetch)	W	M		
<i>Vulpia bromoides</i> (squirrel-tail fescue)				
<i>Vulpia myuros</i> (vulpia, rat's tail fescue)				
<i>Xanthium occidentale</i> (Noogoora burr)	W	H	W	H
<i>Xanthium spinosum</i> (Bathurst burr)	W	M	W	H

<sup>1</sup>Distribution (D) abbreviations: W = widespread;

blank cells = species not considered to be widespread in the catchment or distribution unknown.

<sup>2</sup>Impact (I) abbreviations: H = high; M = medium; L = low.

\*Weeds added by workshop participants not in the original dataset.

**APPENDIX E4.  
TEMPLATE OF LETTER SENT TO PRIVATE LANDHOLDERS WITH  
VOLUNTARY CONSERVATION AGREEMENTS OR WILDLIFE REFUGES  
ON THEIR PROPERTIES**

Date

Address

Dear,

I am involved in a project with the NSW Department of Environment and Climate Change (DECC), NSW Department of Primary Industries (NSW DPI) and Catchment Management Authorities (CMAs) in NSW. The project is identifying widespread weeds that are impacting on biodiversity in each catchment through a series of workshops.

These workshops have already been held in the Lachlan CMA. (A list of the high impact weeds with an indication of the types of vegetation under threat is attached). The next step is to identify sites of high biodiversity value under invasion from weeds that would benefit from weed control. We have developed a site nomination form for this purpose and instructions for completing the form (attached). Site nominations within each CMA will be collated and prioritised as part of the project. This list of sites will then be given to the Lachlan CMA to assist them in prioritising investment for on-ground works in the future.

As you have a Conservation Agreement or a Wildlife Refuge on your property, you may have a site that could be nominated under this project. Please consider nominating a site on your property if you consider it of high biodiversity value and if weed control would benefit the overall biodiversity or threatened species (plants, birds and animals).

For more information about the project please visit the website (below).

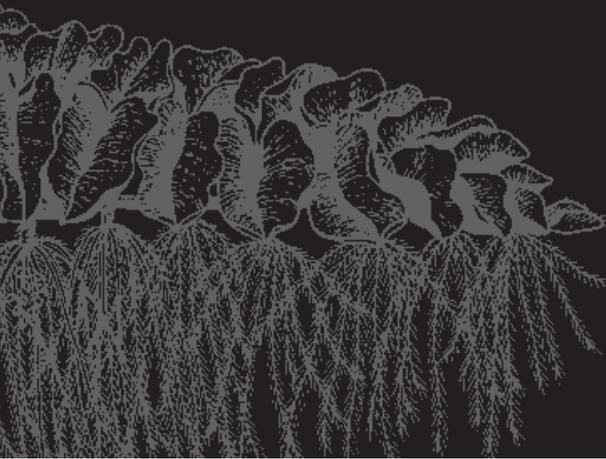
Yours sincerely

Bruce Auld

Project Officer (Weed Evaluation)

NSW DPI/DECC CMA Biodiversity Project

Adjunct Professor Charles Sturt University



## 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