



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

Sydney Metropolitan CMA region

Part L



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L1. 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 Sydney Metropolitan Catchment Management Authority (SMCMA) 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 L) establishes regional priorities, in the form of priority widespread weeds and priority sites for control, in the SMCMA region.

The SMCMA region covers 1,860 square kilometres with landscapes ranging from coastal bays, beaches, and sand dune systems to the broad plains and low hills of the Cumberland woodlands (SMCMA 2009). Approximately three million people live in the region and much of the landscape has been altered dramatically for development. Around 37% of the SMCMA region is composed of native vegetation and of this approximately 42% is in conservation reserves. The region is home to much of Australia's diverse native fauna and flora with biodiversity recognised as nationally and internationally significant.

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 101 weeds were adversely affecting 57 threatened plant and animal species in the SMCMA region (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 SMCMA 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. This information will enable all stakeholders in the SMCMA 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 SMCMA to measure progress towards relevant targets, including the Natural Resource Commission (NRC) target for invasive species (NRC 2005) and Catchment Action Plan (CAP) targets.

L2. REGIONAL CONTEXT

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

L2.1 Catchment Action Plan

Under the *Catchment Management Authorities Act 2003* each CMA is required to prepare a CAP that outlines future priorities for the specific CMA and provides a coordinated plan for natural resource work in the region over a 10-year period. The SMCMA CAP outlines catchment targets under five themes for investment: (i) biodiversity, (ii) water, (iii) land and development, (iv) estuarine, coastal and marine management, and (v) community (SMCMA 2006).

This widespread weed project will primarily contribute to the following Biodiversity catchment targets:

- » B4 – By 2016 threatened species, EECs and populations are better conserved by implementing actions identified in the PAS
- » B5 – By 2016, the impact of invasive species on biodiversity is reduced by decreasing the number, distribution and impact of terrestrial and aquatic invasive weeds and pest animals and by promoting a better understanding of pest pathogens.

Within this catchment target the management target *Invasive species and Key Threatening Processes* (B5.4) will also be addressed:

- » By 2016, populations or patches of invasive species as identified as key threatening processes are included in Threat Abatement Plans and managed according to the priorities in those plans.

Undertaking weed management for biodiversity conservation may also have flow on effects for other CAP targets including:

- » W1 Waterway and Riparian Corridor – By 2016 there is a net improvement in the health of modified waterways and riparian corridors and conservation of natural waterways
- » W2 Wetland condition and extent – By 2016 the condition and net extent of wetlands is improved.

L2.2 Weed Management Strategy for the SMCMA Region

The development of the Weed Management Strategy for the Sydney Metropolitan Region was initiated by the Sydney Weeds Committees to assist with planning and co-ordination of weed management across the SMCMA.

The three main goals of the strategy are to: (i) prevent new weed problems, (ii) reduce the impact of existing priority weed problems and (iii) enhance our capacity and commitment to solve weed problems. This project will directly contribute to:

- » Goal 2.3 – to develop approaches to managing weeds based on the protection of values and assets by identifying high priority areas and assets that are most at risk from high priority weeds, e.g. top of catchments, endangered ecological communities/threatened species, biodiversity and fauna habitat corridors.

SMCMA weed ranking

Following the completion of the Weed Management Strategy for the Sydney Metropolitan Region, a list of 20 high priority environmental weeds in the Catchment was determined using Rod Randall's ranking process (Randall 2000). The process considers the invasiveness of the weed, its potential impacts, its potential distribution and whether it is feasible to eradicate the weed. Information on the biology and distribution of the weeds is used to allocate a score to allow ranking. Priority is given to new and emerging threats while widespread weeds are given a lower priority. Of the top 20 weeds identified by the ranking process, only 3 were widespread across the region. The remaining 17 were identified as priorities for regional mapping and control. This project will complement the priority list of weeds by identifying priority areas for investment in the control of widespread weeds.

L2.3 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 the SMCMA region include:

- » South West Sydney
- » Sydney Central
- » Sydney North
- » Sydney West-Blue Mountains

(note: their boundaries do not align with those of the CMA).

Regional weed management plans are developed by these regional weeds advisory committees and target specific noxious weed species for control within a defined area of operation. They outline the biology of the weed and its impacts as well as overall objectives and actions required to coordinate an effective control program.

L2.4 Office of Environment & Heritage (OEH) Regional pest management strategies

Within the SMCMA 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.

As the NPWS regional boundaries do not align with those of the CMA regions, there are three strategies relevant to the Sydney Metropolitan region: (i) Sydney South, (ii) Sydney, and (iii) Sydney North strategies (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*).

L2.5 Priorities Action Statement

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, population and ecological communities and manage key threatening processes (KTPs).

There are 30 actions relevant to weed management in the SMCMA region (Appendix L1). Of these, 14 actions are associated with implementation of the Bitou Bush Threat Abatement Plan (TAP) (DEC 2006), 11 are generic recommending targeted bush regeneration or general weed management, while only 5 of the actions direct weed control programs to specific weeds and/or sites.

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.

L3. REGIONAL OUTPUTS

L3.1 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 *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)).

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

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 SMCMA 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*.

L3.1.1 Workshops in the SMCMA region

Two workshops were held in the SMCMA region at Hurstville and Parramatta on 5 and 6 December 2007 respectively. More than 160 people from 39 councils and 24 government departments and community organisations were invited to attend. Representatives from OEH (formerly DECCW), SMCMA, Sydney Weeds Committees, local councils, Conservation Volunteers Australia, Landcare, Sydney Olympic Park Authority, Sydney Water Corporation and a private consultant attended the workshops. See Appendix L2 for a full list of attendees.

L3.1.2 SMCMA specific website

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

L3.2 The process

L3.2.1 Stage 1. Identifying weeds that pose a threat in the SMCMA region

A weeds dataset for the SMCMA 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 sources listed in Section L2.

Distribution of weeds within the SMCMA region

The weeds dataset for the SMCMA region was presented to workshop participants who were asked to identify the current distribution of each of the weeds according to the categories outlined in Table L1. The distribution for each weed considered, plus weeds added by participants, is provided in Appendix L3.

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 L2). Thirty four weeds were identified as having the highest impact on biodiversity at one or both workshops and constituted a draft list of priority weeds which was distributed to workshop participants and other stakeholders for comment. Comments from stakeholders were incorporated in the list and resulted in Table L3.

Table L1. 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 L2. 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 L3. Priority widespread weeds impacting on biodiversity in the Sydney Metropolitan CMA region (listed in alphabetical order).

Scientific name (Common name)	KTP ¹	WoNS ²	Noxious	
			NSW ³	LGA ⁴
<i>Acetosa sagittata</i> (turkey rhubarb)	Y			Y
<i>Anredera cordifolia</i> (Madeira vine)	Y			Y
<i>Asparagus aethiopicus</i> (asparagus fern)	Y			Y
<i>Asparagus asparagoides</i> (bridal creeper, florist's smilax)	Y	Y	5	Y
<i>Asparagus plumosus</i> (climbing asparagus)	Y			Y
<i>Asparagus scandens</i> (asparagus fern)	Y			
<i>Bryophyllum delagoense</i> (mother of millions)	Y*			Y
<i>Cardiospermum grandiflorum</i> (balloon vine)	Y			Y
<i>Cestrum parqui</i> (green cestrum)	Y*			Y
<i>Chlorophytum comosum</i> (spider plant)				
<i>Cinnamomum camphora</i> (camphor laurel)	Y*			Y
<i>Delairea odorata</i> (Cape ivy)	Y			Y
<i>Egeria densa</i> (dense waterweed)			5	
<i>Ehrharta erecta</i> (panic veldgrass)				
<i>Eragrostis curvula</i> (African lovegrass)	Y			
<i>Ipomoea cairica</i> (coastal morning glory)	Y			Y
<i>Ipomoea indica</i> (blue morning glory)	Y			Y
<i>Ipomoea purpurea</i> (common morning glory)	Y			
<i>Juncus acutus</i> (spiny rush)				
<i>Juncus articulatus</i> (joint rush)				
<i>Ligustrum lucidum</i> (large-leaf privet)	Y*			Y
<i>Ligustrum sinense</i> (small-leaf privet)	Y*			Y
<i>Lonicera japonica</i> (Japanese honeysuckle)	Y			
<i>Macfadyena unguis-cati</i> (cat's claw creeper)	Y			Y
<i>Nephrolepis cordifolia</i> (fishbone fern)				
<i>Ochna serrulata</i> (ochna)	Y*			Y
<i>Olea europaea</i> (African olive and European olive)	Y*			
<i>Paspalum quadrifarium</i> (blue grass)				Y
<i>Pennisetum clandestinum</i> (kikuyu)	Y			
<i>Phyllostachys</i> spp. (bamboo)				Y
<i>Rubus fruticosus</i> agg. (blackberry)	Y*	Y	4	
<i>Salix</i> spp. (willow)	Y*	Y	5	
<i>Senna pendula</i> (senna)	Y*			Y
<i>Tradescantia fluminensis</i> (trad)				Y

KTP¹ = Weed listed under a key threatening process in the TSC Act; WoNS² = Weeds of National Significance (Thorp and Lynch 2000); NSW³ = All of 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*.

L3.2.2 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 SMCMA region. They were asked to consider if communities or 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, vegetation communities and threatened species that are considered under threat from the high priority weeds (Tables L4, L5 and L6). This information was used to help guide site nominations (see Stage 3).

The lists of EECs, vegetation communities and threatened species are by no means exhaustive, but are likely to represent communities and species where the priority weeds are having the greatest immediate impact. The lists can 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 impacted by the greatest number of high priority weeds was Southern Sydney Sheltered Forest on Transitional Sandstone Soils (26 high priority weeds), followed by Blue Gum High Forest and Sydney Turpentine-Ironbark Forest (24 high priority weeds impacting) and Shale/Sandstone Transition Forest (23 high priority weeds impacting) (Table L4). The weeds impacting the greatest number of endangered ecological communities included senna (*Senna pendula*) (21 EECs), followed by blackberry (*Rubus fruticosus* agg.) (20 EECs) and trad (*Tradescantia fluminensis*) (19 EECs).

Impact of widespread weeds on threatened plants and animals

This process identified eight native flora (Table L5) and 17 native fauna (Table L6) species and populations at risk from one or more of the high priority weeds in the SMCMA region. For native flora species, sunshine wattle (*Acacia terminalis*) had the highest number of weeds threats (14 weeds), followed by hairy geebung (*Persoonia hirsuta*) (11 weeds) and white flowered flax plant (*Cynanchum elegans*) (9 weeds). For native fauna species the turquoise parrot (*Neophema pulchella*) and speckled warbler (*Pyrrholaemus sagittatus*) were identified as having the greatest number of high priority weeds threatening (15 weeds) followed by the red-crowned toadlet (*Pseudophryne australis*) and the Cumberland land snail (*Meridolum corneovirens*) (13 weeds).

For the SMCMA region the NSW Bitou bush Threat Abatement Plan (DEC 2006) and the national Plan to Protect Environmental Assets from Lantana (NLMG 2010) list the biodiversity at risk from bitou bush (*Chrysanthemoides monilifera* subsp. *rotundata*) and lantana (*Lantana camara*) (see www.environment.nsw.gov.au/bitouTAP/biodiversityatrisk.htm and www.environment.nsw.gov.au/lantanaplan/biodiversityatrisk.htm).

L3.2.3 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 *statewide framework*) were emailed to key stakeholders (including workshop participants), and placed on the SMCMA 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 SMCMA region, along with a letter outlining the aims of the project (Appendix L4) 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.

Control categories

The 257 sites nominations to date (as at 31 August 2010) for the SMCMA region were separated into six categories using the site ranking process outlined in Appendix 4 of the *statewide framework*. The ranking of sites provided strategic direction for on-ground works by identifying areas where weed control programs will have positive benefits for biodiversity.

This process resulted in 81 sites in control category 1 (Table L7). 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.

L3.2.4 Review and additional site nominations

A draft of this report was provided to SMCMA 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. As this framework is applicable to all widespread weeds impacting on biodiversity, sites in New South Wales that were previously included in the Bitou TAP (DEC 2006) and national lantana plan (NLMG 2010) were incorporated into this project.

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 SMCMA 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 L4. Communities under threat from priority widespread weeds in the SMCMA region as determined by Stages 1 and 2*.

Scientific name	Blue Gum High Forest	Castlereagh Swamp Woodland Community	Coastal Saltmarsh	Cooks River/ Castlereagh Ironbark Forest	Cumberland Plain Woodland	Duffys Forest	Eastern Suburbs Banksia Scrub	Freshwater Wetlands on Coastal Floodplains
<i>Acetosa sagittata</i> (turkey rhubarb)								
<i>Anredera cordifolia</i> (Madeira vine)								
<i>Asparagus aethiopicus</i> (asparagus fern)								
<i>Asparagus asparagoides</i> (bridal creeper, florist's smilax)								
<i>Asparagus plumosus</i> (climbing asparagus)								
<i>Asparagus scandens</i> (asparagus fern)								
<i>Bryophyllum delagoense</i> (mother of millions)								
<i>Cardiospermum grandiflorum</i> (balloon vine)								
<i>Cestrum parqui</i> (green cestrum)								
<i>Chlorophytum comosum</i> (spider plant)								
<i>Cinnamomum camphora</i> (camphor laurel)								
<i>Delairea odorata</i> (Cape ivy)								
<i>Egeria densa</i> (dense waterweed)								
<i>Ehrharta erecta</i> (panic veldgrass)								
<i>Eragrostis curvula</i> (African lovegrass)								
<i>Ipomoea cairica</i> (coastal morning glory)								
<i>Ipomoea indica</i> (blue morning glory)								
<i>Ipomoea purpurea</i> (common morning glory)								
<i>Juncus acutus</i> (spiny rush)								
<i>Juncus articulatus</i> (joint rush)								
<i>Ligustrum lucidum</i> (large-leaf privet)								
<i>Ligustrum sinense</i> (small-leaf privet)								
<i>Lonicera japonica</i> (Japanese honeysuckle)								
<i>Macfadyena unguis-cati</i> (cat's claw creeper)								
<i>Nephrolepis cordifolia</i> (fishbone fern)								
<i>Ochna serrulata</i> (ochna)								
<i>Olea europaea</i> (African olive, European olive)								
<i>Paspalum quadrifarium</i> (blue grass)								
<i>Pennisetum clandestinum</i> (kikuyu)								
<i>Phyllostachys</i> spp. (bamboo)								
<i>Rubus fruticosus</i> agg. (blackberry)								
<i>Salix</i> spp. (willow)								
<i>Senna pendula</i> (senna)								
<i>Tradescantia fluminensis</i> (trad)								

**Lantana camara* and *Chrysanthemoides monilifera*, bitou bush (subsp. *rotundata*) are not included above as biodiversity threatened by these weed species has already been determined in the national Plan to Protect Environmental Assets from Lantana (NLMG 2010) and the NSW Bitou bush Threat Abatement Plan (DEC 2006).

Table L5. Threatened flora species and populations under threat from priority widespread weeds in the SMCMA region*.

Native plants impacted	Weed threat
Scientific name (Common name)	Scientific name (Common name)
<i>Acacia pubescens</i> (downy wattle, hairy stemmed wattle)	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Eragrostis curvula</i> (African lovegrass)
	<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)
	<i>Rubus fruticosus</i> agg. (blackberry)
<i>Acacia terminalis</i> (sunshine wattle)	<i>Acetosa sagittata</i> (rambling dock)
	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Bryophyllum delagoense</i> (mother of millions)
	<i>Cestrum parqui</i> (green cestrum)
	<i>Eragrostis curvula</i> (African lovegrass)
	<i>Lantana camara</i> (lantana)
	<i>Ligustrum lucidum</i> (large-leaf privet)
	<i>Ligustrum sinense</i> (small-leaf privet)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Ochna serrulata</i> (Mickey Mouse plant)
	<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)
	<i>Pennisetum clandestinum</i> (kikuyu)
	<i>Rubus fruticosus</i> agg. (blackberry)
<i>Tradescantia fluminensis</i> (trad)	
<i>Allocasuarina portuensis</i> (Neilsen Park she-oak)	<i>Acetosa sagittata</i> (rambling dock)
	<i>Anredera cordifolia</i> (Madeira vine)
	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Asparagus asparagoides</i> (bridal creeper)
	<i>Asparagus scandens</i> (climbing asparagus)
	<i>Lantana camara</i> (lantana)
	<i>Tradescantia fluminensis</i> (trad)
<i>Cynanchum elegans</i> (white flowered flax plant)	<i>Anredera cordifolia</i> (Madeira vine)
	<i>Asparagus asparagoides</i> (bridal creeper)
	<i>Asparagus plumosus</i> (asparagus fern)
	<i>Cardiospermum glandiflorum</i> (balloon vine)
	<i>Delairea odorata</i> (Cape ivy)
	<i>Ipomoea indica</i> (blue morning glory)
	<i>Ipomoea purpurea</i> (common morning glory)
	<i>Macfadyena unguis-cati</i> (cat's claw creeper)
	<i>Tradescantia fluminensis</i> (trad)

Native plants impacted	Weed threat
Scientific name (Common name)	Scientific name (Common name)
<i>Eucalyptus camfieldii</i> (Camfield's stringybark)	<i>Acetosa sagittata</i> (rambling dock)
	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Bryophyllum delagoense</i> (mother of millions)
	<i>Cestrum parqui</i> (green cestrum)
	<i>Lantana camara</i> (lantana)
	<i>Ligustrum lucidum</i> (large-leaf privet)
	<i>Ligustrum sinense</i> (small-leaf privet)
	<i>Tradescantia fluminensis</i> (trad)
<i>Grevillea caleyi</i> (Caley's grevillea)	<i>Asparagus aethiopicus</i> (asparagus fern)
<i>Persoonia hirsuta</i> (hairy geebung)	<i>Anredera cordifolia</i> (Madeira vine)
	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Asparagus asparagoides</i> (bridal creeper)
	<i>Delairea odorata</i> (Cape ivy)
	<i>Ipomoea indica</i> (blue morning glory)
	<i>Ipomoea cairica</i> (coastal morning glory)
	<i>Ipomoea purpurea</i> (common morning glory)
	<i>Lantana camara</i> (lantana)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)
	<i>Tradescantia fluminensis</i> (trad)
	<i>Pimelea spicata</i> (spiked rice flower)
<i>Chlorophytum comosum</i> (spider plant)	
<i>Eragrostis curvula</i> (African lovegrass)	
<i>Lantana camara</i> (lantana)	
<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)	
<i>Pennisetum clandestinum</i> (kikuyu)	
<i>Rubus fruticosus</i> agg. (blackberry)	
<i>Tradescantia fluminensis</i> (trad)	

*Lantana (*Lantana camara*), bitou bush and boneseed (*Chrysanthemoides monilifera*), were not considered above as their impacts were already determined in the national Plan to protect environmental assets from lantana (NLMG 2010) and the *NSW Threat Abatement Plan: invasion of native plant communities by Chrysanthemoides monilifera (bitou bush and boneseed)* (DEC 2006).

Table L6. Threatened fauna species and populations under threat from priority widespread weeds in the SMCMA region*.

Native fauna impacted	Weed threat
Scientific name (Common name)	Scientific name (Common name)
Bat species including: <i>Falsistrellus tasmaniensis</i> (eastern false pipistrelle) <i>Mormopterus norfolkensis</i> (eastern freetail bat) <i>Scoteanax rueppellii</i> (greater broad nosed bat) <i>Myotis adversus</i> (large-footed myotis) <i>Saccolaimus flaviventris</i> (yellow bellied sheathtail bat)	<i>Anredera cordifolia</i> (Madeira vine)
	<i>Asparagus plumosus</i> (climbing asparagus)
	<i>Cardiospermum glandiflorum</i> (balloon vine)
	<i>Delairea odorata</i> (Cape ivy)
	<i>Ipomoea cairica</i> (coastal morning glory)
	<i>Ipomoea indica</i> (blue morning glory)
	<i>Ipomoea purpurea</i> (common morning glory)
	<i>Juncus acutus</i> (spiny rush)
	<i>Juncus articulatus</i> (joint rush)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Macfadyena unguis-cati</i> (cat's claw creeper)
<i>Meridolum corneovirens</i> (Cumberland land snail)	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Asparagus asparagoides</i> (bridal creeper)
	<i>Bryophyllum delagoense</i> (mother of millions)
	<i>Cestrum parqui</i> (green cestrum)
	<i>Chlorophytum comosum</i> (spider plant)
	<i>Eragrostis curvula</i> (African lovegrass)
	<i>Lantana camara</i> (lantana)
	<i>Ligustrum lucidum</i> (large-leaf privet)
	<i>Ligustrum sinense</i> (small-leaf privet)
	<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)
	<i>Pennisetum clandestinum</i> (kikuyu)
	<i>Rubus fruticosus</i> agg. (blackberry)
	<i>Tradescantia fluminensis</i> (trad)
<i>Litoria aurea</i> (green and golden bell frog)	<i>Asparagus scandens</i> (climbing asparagus)
	<i>Delairea odorata</i> (Cape ivy)
	<i>Juncus acutus</i> (spiny rush)
	<i>Juncus articulatus</i> (joint rush)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Macfadyena unguis-cati</i> (cat's claw creeper)
	<i>Rubus fruticosus</i> agg. (blackberry)
	<i>Tradescantia fluminensis</i> (trad)
Owl species including: <i>Ninox connivens</i> (barking owl) <i>Tyto novaehollandiae</i> (masked owl) <i>Ninox strenua</i> (powerful owl) <i>Tyto tenebricosa</i> (sooty owl)	<i>Anredera cordifolia</i> (Madeira vine)
	<i>Asparagus plumosus</i> (climbing asparagus)
	<i>Cardiospermum glandiflorum</i> (balloon vine)
	<i>Delairea odorata</i> (Cape ivy)
	<i>Ipomoea cairica</i> (coastal morning glory)
	<i>Ipomoea indica</i> (blue morning glory)
	<i>Ipomoea purpurea</i> (common morning glory)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Macfadyena unguis-cati</i> (cat's claw creeper)

Native fauna impacted	Weed threat
Scientific name (Common name)	Scientific name (Common name)
<i>Pseudophryne australis</i> (red-crowned toadlet)	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Asparagus plumosus</i> (climbing asparagus)
	<i>Asparagus scandens</i> (asparagus fern)
	<i>Bryophyllum delagoense</i> (mother of millions)
	<i>Chlorophytum comosum</i> (spider plant)
	<i>Lantana camara</i> (lantana)
	<i>Ligustrum lucidum</i> (large-leaf privet)
	<i>Ligustrum sinense</i> (small-leaf privet)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Nephrolepis cordifolia</i> (fishbone fern)
	<i>Ochna serrulata</i> (Mickey Mouse plant)
	<i>Rubus fruticosus</i> agg. (blackberry)
	<i>Tradescantia fluminensis</i> (trad)
<i>Pyrrholaemus sagittatus</i> (speckled warbler)	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Asparagus asparagoides</i> (bridal creeper)
	<i>Asparagus scandens</i> (asparagus fern)
	<i>Bryophyllum delagoense</i> (mother of millions)
	<i>Cestrum parqui</i> (green cestrum)
	<i>Ehrharta erecta</i> (panic veldtgrass)
	<i>Eragrostis curvula</i> (African lovegrass)
	<i>Lantana camara</i> (lantana)
	<i>Ligustrum lucidum</i> (large-leaf privet)
	<i>Ligustrum sinense</i> (small-leaf privet)
	<i>Ochna serrulata</i> (Mickey Mouse plant)
	<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)
	<i>Pennisetum clandestinum</i> (kikuyu)
	<i>Rubus fruticosus</i> agg. (blackberry)
	<i>Tradescantia fluminensis</i> (trad)
<i>Petaurus norfolcensis</i> (squirrel glider)	<i>Anredera cordifolia</i> (Madeira vine)
	<i>Asparagus plumosus</i> (climbing asparagus)
	<i>Cardiospermum glandiflorum</i> (balloon vine)
	<i>Delairea odorata</i> (Cape ivy)
	<i>Ipomoea cairica</i> (coastal morning glory)
	<i>Ipomoea indica</i> (blue morning glory)
	<i>Ipomoea purpurea</i> (common morning glory)
	<i>Lonicera japonica</i> (Japanese honeysuckle)
	<i>Macfadyena unguis-cati</i> (cat's claw creeper)

Native fauna impacted	Weed threat
Scientific name (Common name)	Scientific name (Common name)
<i>Neophema pulchella</i> (turquoise parrot)	<i>Asparagus aethiopicus</i> (asparagus fern)
	<i>Asparagus asparagoides</i> (bridal creeper)
	<i>Asparagus scandens</i> (climbing asparagus)
	<i>Bryophyllum delagoense</i> (mother of millions)
	<i>Cestrum parqui</i> (green cestrum)
	<i>Ehrharta erecta</i> (panic veldtgrass)
	<i>Eragrostis curvula</i> (African lovegrass)
	<i>Lantana camara</i> (lantana)
	<i>Ligustrum lucidum</i> (large-leaf privet)
	<i>Ligustrum sinense</i> (small-leaf privet)
	<i>Ochna serrulata</i> (Mickey Mouse plant)
	<i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive)
	<i>Pennisetum clandestinum</i> (kikuyu)
	<i>Rubus fruticosus</i> agg. (blackberry)
<i>Tradescantia fluminensis</i> (trad)	
endangered little penguin population on North Head	<i>Pennisetum clandestinum</i> (kikuyu)
endangered long-nosed bandicoot population on North Head	<i>Lantana camara</i> ^ (lantana)
	<i>Ligustrum lucidum</i> ^ (large-leaf privet)
	<i>Ligustrum sinense</i> ^ (small-leaf privet)
	<i>Rubus fruticosus</i> agg.^ (blackberry)

*Lantana (*Lantana camara*), bitou bush and boneseed (*Chrysanthemoides monilifera*), were not considered above as their impacts were already determined in the national Plan to protect environmental assets from lantana (NLMG 2010) and the *NSW Threat Abatement Plan: invasion of native plant communities by Chrysanthemoides monilifera (bitou bush and boneseed)* (DEC 2006).

^ potentially detrimental probably not currently impacting.

Table L7. The number of sites in each of the six control categories in the SMCMA region as at 31 August 2010.

	Categories						Not valid^	Total
	1*	2	3	4	5	6		
Number of sites	81	31	33	55	30	7	20	257

*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.

L4. SUMMARY FOR SYDNEY METROPOLITAN 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.

Control programs at priority sites will 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.

L4.1 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 SMCMA region, can also be used to meet a range of CMA priorities. This project directly addresses the SMCMA CAP targets as outlined in Section L2.1, 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 SMCMA. 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).

L4.2 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 SMCMA 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 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 SMCMA 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*).

L4.3 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 SMCMA region. As conditions or management requirements change at existing sites, and as information on new sites becomes available, they can be included in the SMCMA 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 SMCMA contained site nominations received before December 2008. All site nominations received during 2009 and up until August 2010 were included and ranked in this final report. Any additional site nominations or changes to existing nominations should be provided to the relevant contact within SMCMA for inclusion in the site spreadsheet and sites should subsequently be re-ranking by SMCMA.

The list of priority sites will be kept by SMCMA 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.

L5. REFERENCES

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L6. APPENDICES

Appendix L1: Current actions in the Priorities Action Statement relating to weed management in the SMCMA region

Appendix L2: Attendees at SMCMA weed impacts to biodiversity workshops

Appendix L3: All weeds considered at workshops in the SMCMA region, their distribution and their relative impact on biodiversity

Appendix L4: Template of letter sent to private landholders with voluntary conservation agreements or wildlife refuges on their properties

**APPENDIX L1.
CURRENT ACTIONS IN THE PRIORITIES ACTION STATEMENT RELATING
TO WEED MANAGEMENT IN THE SMCMA REGION**

Threatened species, populations and communities	Type of species	Level of threat	Priority actions in PAS relating to weed management
High priority			
<i>Acacia clunies-rossiae</i>	Shrubs	V	Develop and implement weed control and monitoring programs along the Kowmung River.
Blue Gum High Forest	Threatened Ecological Communities	E	Undertake priority weed control works.
<i>Chamaesyce psammogeton</i>	Herbs and Forbs	E	Undertake bitou bush/boneseed control; giving priority to sites identified in the TAP.
<i>Cynanchum elegans</i>	Epiphytes and Climbers	E	Undertake weed control using DECC guidelines for bush regeneration activities. Implement bitou bush control as described in the approved TAP.
<i>Darwinia glaucophylla</i>	Shrubs	V	Undertake weed control; priority given to sites at urban interface.
<i>Eucalyptus camfieldii</i>	Mallees	V	Undertake identified priority weed control; e.g. Stewart Ave Hornsby.
<i>Eulamprus leuraensis</i>	Reptiles	E	Control invasion of Pinus species into sites within or adjoining Newnes SF and control weeds at sites adjoining urban areas or impacted by runoff from the Great Western Highway.
<i>Galium australe</i>	Herbs and Forbs	E	Assess threat posed by weeds particularly at sites adjacent to urban areas e.g. Hornsby LGA and liaise with relevant land managers to initiate a control and monitoring program as required.
<i>Gentiana wingecarriensis</i>	Herbs and Forbs	E	Continue woody weed control in Wingecarribee Swamp. Control exotic pasture grass invasion of species habitat on margins of Wingecarribee Swamp.
<i>Grevillea caleyi</i>	Shrubs	E	Implement weed control and bush regeneration across sites identified in the recovery plan for the species.
<i>Hibbertia procumbens</i>	Shrubs	E	Undertake targeted bush regeneration works; where required.
<i>Keraudrenia corrolata</i> var. <i>denticulata</i> - endangered population	Endangered Populations	E	Remove weeds and control further spread.
<i>Lepidosperma evansianum</i>	Herbs and Forbs	V	Implement targeted weed control programs (may tie in with Microstrobos weed control).
Littoral Rainforest in the NSW North Coast; Sydney Basin and South East Corner Bioregions	Threatened Ecological Communities	E	Undertake weed control for bitou bush and boneseed at priority sites in accordance with the approved Threat Abatement Plan and associated PAS actions.
<i>Lysimachia vulgaris</i> var. <i>davurica</i>	Herbs and Forbs	E	Continue woody weed control in Wingecarribee Swamp and Burrumbowlie Swamp.
<i>Microstrobos fitzgeraldii</i>	Shrubs	E	Implement targeted weed control programs at known sites where necessary.
<i>Microtis angusii</i>	Orchids	E	Pest management and weed assessment and management trials will be undertaken.
<i>Miniopterus schreibersii oceanensis</i>	Bats	V	Undertake non-chemical removal of weeds (e.g. lantana; blackberry) to prevent obstruction of cave entrances.
<i>Olearia cordata</i>	Shrubs	V	Undertake necessary weed control; priority site Wisemans Ferry Historic Site.
<i>Paralucia spinifera</i>	Invertebrates	E	Undertake weed control on relevant lands in accordance with guidelines. SFNSW will undertake weed control in areas of large infestation of <i>Cytisus scoparius</i> adjacent to site 9.
<i>Persoonia mollis</i> subsp. <i>maxima</i>	Shrubs	E	Undertake weed management in Cockle Creek; Calna Creek and Berowara Creek catchments.

Threatened species, populations and communities	Type of species	Level of threat	Priority actions in PAS relating to weed management
<i>Petalura gigantea</i>	Invertebrates	E	Control invasion of Pinus species into Penrose Swamp; at swamp habitat within or adjoining Newnes SF and control weeds at sites adjoining urban areas or impacted by runoff from the Great Western Highway.
<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.
<i>Prasophyllum fuscum</i>	Orchids	V	Continue woody weed control in Wingecarribee Swamp. Control exotic pasture grass invasion of species habitat on margins of Wingecarribee Swamp.
<i>Prasophyllum uroglossum</i>	Orchids	E	Attempt to control exotic pasture grass invasion of species habitat on margins of Wingecarribee Swamp. Continue woody weed control in Wingecarribee Swamp.
<i>Prostanthera stricta</i>	Shrubs	V	Undertake priority weed control especially at Stockyard Point Mt Vincent; Genowlan Mt; Eagal View Mt Vincent; SE Mt Ida.
Sun Valley Cabbage Gum Forest in the Sydney Basin Bioregion	Threatened Ecological Communities	E	Actively control weeds in EEC remnants using bush regeneration techniques.
White Box Yellow Box Blakely's Red Gum Woodland	Threatened Ecological Communities	E	Target priority weeds for control.

Medium priority

<i>Acacia baueri</i> subsp. <i>aspera</i>	Shrubs	V	Undertake targeted bush regeneration works; where required.
<i>Acacia bynoeana</i>	Shrubs	E	Undertake targeted bush regeneration works; where required.
<i>Acacia gordonii</i>	Shrubs	E	Undertake targeted bush regeneration works; where required.
Agnes Banks Woodland in the Sydney Basin Bioregion	Threatened Ecological Communities	E	Ensure the consideration of impacts on EECs when enforcing noxious weed or pest species control in EECs.
<i>Asterolasia elegans</i>	Shrubs	E	Undertake targeted bush regeneration works; where required; incl. along Laughtondale Gully Road (Hornsby LGA).
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	Threatened Ecological Communities	E	Actively control weeds using bush regeneration techniques.
Coastal Saltmarsh in the NSW North Coast; Sydney Basin and South East Corner Bioregions	Threatened Ecological Communities	E	Undertake weed control for bitou bush and boneseed at priority sites in accordance with the approved Threat Abatement Plan.
<i>Dillwynia tenuifolia</i> - endangered population Kemp's Creek	Endangered Populations	E	Conduct weed removal and rehabilitation targeting localised occurrences of highly invasive weed species such as privet; honeysuckle; castor oil plant; pampas grass; wild tobacco and <i>Eragrostis curvula</i> .
<i>Eucalyptus benthamii</i>	Trees	V	Prepare and implement provisions in habitat management plans to control weeds.
<i>Euphrasia bowdeniae</i>	Herbs and Forbs	V	Undertake targeted bush regeneration works; where required.
Genowlan Point (<i>Allocasuarina nana</i>) Heathland	Threatened Ecological Communities	E	Undertake targeted bush regeneration works where required to control weeds.
<i>Grevillea parviflora</i> subsp. <i>supplicans</i>	Shrubs	E	Undertake targeted bush regeneration works; where required.
<i>Gyrostemon thesioides</i>	Shrubs	E	Perform weeding at sites where determined necessary.
<i>Leptospermum deanei</i>	Shrubs	V	Conduct weed control where necessary.
<i>Melaleuca biconvexa</i>	Trees	V	Undertake targeted bush regeneration works; where required.

Threatened species, populations and communities	Type of species	Level of threat	Priority actions in PAS relating to weed management
<i>Melaleuca deanei</i>	Shrubs	V	Undertake targeted bush regeneration works; where required.
<i>Meridolum corneovirens</i>	Invertebrates	E	Implement weed control at sites where necessary.
O'Hares Creek Shale Forest	Threatened Ecological Communities	E	Undertake targeted bush regeneration work to restore and maintain remnants.
<i>Persoonia bargoensis</i>	Shrubs	E	Undertake targeted bush regeneration works and weed control; where required.
<i>Persoonia hirsuta</i>	Shrubs	E	Undertake targeted bush regeneration works and weed control; where required.
<i>Pimelea curviflora</i> var. <i>curviflora</i>	Shrubs	V	Conduct weed management; particularly at populations near land used for agriculture.
Pittwater Spotted Gum Forest	Threatened Ecological Communities	E	Undertake priority weed control.
<i>Pomaderris adnata</i>	Shrubs	E	Undertake weed control in accordance with site management statement.
<i>Potorous tridactylus</i>	Marsupials	V	Control weeds; particularly those that affect the understorey layer; in long-nosed potoroo habitat.
<i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i>	Shrubs	V	Undertake priority weed control actions at sites where weed invasion has been identified as an issue.
<i>Prostanthera junonis</i>	Shrubs	E	Undertake weed control activities as appropriate using approved bush regeneration methods.
<i>Pterostylis saxicola</i>	Orchids	E	Undertake targeted bush regeneration works; where required.
<i>Ptilinopus superbus</i>	Birds	V	Undertake weed control in and adjacent to littoral rainforest to augment fruit-dove habitat.
<i>Pultenaea glabra</i>	Shrubs	V	Prevent runoff from residential areas into known habitat for this species. Undertake appropriate weed control activities where necessary.
<i>Rutidosis leptorrhynchoides</i>	Herbs and Forbs	E	Control weeds at Gundry TSR.
Swamp oak floodplain forest of the NSW North Coast; Sydney Basin and South East Corner bioregions	Threatened Ecological Communities	E	Undertake weed control for bitou bush and boneseed at priority sites in accordance with the approved Threat Abatement Plan and associated PAS actions.
Swamp sclerophyll forest on coastal floodplains of the NSW North Coast; Sydney Basin and South East Corner bioregions	Threatened Ecological Communities	E	Undertake weed control for bitou bush and boneseed at priority sites in accordance with the approved Threat Abatement Plan and associated PAS actions.
<i>Syconycteris australis</i>	Bats	V	Control coastal weed species e.g. 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.
<i>Tetratheca juncea</i>	Shrubs	V	Undertake weed control activities as appropriate using approved bush regeneration methods at priority sites on private and public land.
<i>Themeda australis</i>	Threatened Ecological Communities	E	Undertake weed control for bitou bush and boneseed at priority sites in accordance with the approved Threat Abatement Plan and associated PAS actions.
<i>Thesium australe</i>	Herbs and Forbs	V	Implement bitou bush control as described in the approved TAP.
<i>Trachymene saniculifolia</i>	Herbs and Forbs	E	Undertake targeted bush regeneration works; where required.

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

V = listed as vulnerable under the TSC Act.

E = listed as endangered under the TSC Act.

**APPENDIX L2.
ATTENDEES AT SMCMA WEED IMPACTS TO BIODIVERSITY
WORKSHOPS**

Name	Organisation	Position
Wednesday 5 December 2007 at Hurstville		
Tatjana Schmidt	Conservation Volunteers Australia	Team Leader
Kelly Saunderson	SMCMA/Sydney Weeds Committees	Project Officer
Paul Price	Sutherland Shire Council	Noxious Weeds Officer
Peter Draper	DECCW	Ranger Lane Cove River Area
Andrew Jack	Sydney Olympic Park Authority	Habitat Management Officer
Chris Bartlett	Landcare	Organiser (Cooks River site)
Phil Clunas	Sutherland Shire Council	Noxious Weeds Officer
Thursday 6 December 2007 at Parramatta		
Jillian Macintyre	Warringah Council	Noxious Weed Officer
Michael Mathias	Sydney Water Corporation	Environmental Program Manager – Water, Property and Sewerfix
Jim Killen	DECCW	Ranger, Cumberland South Area, West Sydney Parklands Trust
Tanya Leary	DECCW	Biodiversity Officer
Jo Lynch	SMCMA / Sydney Weeds	Project Officer
Tom Hazell	Conservation Volunteers Australia and Warringah Friends of the Bush	Casual Team Leader (Committee for Manly Lagoon)
Phil Murphy	Parramatta City Council	Supervisor Natural Resources
Michael Dixon	Waratah Eco Works	Director
Kathleen Hellman	DECCW	Ranger Sydney Harbour National Park
Andrew Bayley	DECCW	Ranger
Lyndal Kaye	DECCW	Senior Ranger Cumberland South

DECCW is now known as Office of Environment & Heritage (OEH)

APPENDIX L3.
ALL WEEDS CONSIDERED AT WORKSHOPS IN THE SMCMA REGION,
THEIR DISTRIBUTION AND THEIR RELATIVE IMPACT ON BIODIVERSITY

Table L8. Primary list of weeds considered at workshops in the SMCMA region.

Primary list of weeds considered at workshops	Parramatta		Hurstville	
	D ¹	I ²	D ¹	I ²
<i>Acacia saligna</i> (golden wreath wattle, orange wattle, blue-leafed wattle)	W-s	M	L	
<i>Acetosa sagittata</i> (rambling dock, turkey rhubarb)	W-d	VH	W-d	VH
<i>Ageratina adenophora</i> (crofton weed)	W-d	H	W-d	H
<i>Ageratina riparia</i> (mistflower, creeping crofton weed)	W-d	H	W-d	H
<i>Ambrosia artemisiifolia</i> (annual ragweed)	L		L	
<i>Ammophila arenaria</i> (bishop's weed, bullwort)	L		NP	
<i>Andropogon virginicus</i> (whiskey grass, broom sedge)	W-d	H	W-s	M
<i>Anredera cordifolia</i> (Madeira vine, lamb's tail, jalap, potato vine)	W-d	H	W-d	H
<i>Anthoxanthum odoratum</i> (sweet vernal grass)			NP	
<i>Araujia sericifera</i> (moth vine, mothplant)	W-d	H	W-d	H
<i>Arctotheca calendula</i> (capeweed, cape dandelion)	L		W-s	L
<i>Asparagus aethiopicus</i> (asparagus fern)	W-d	VH	W-d	VH
<i>Asparagus asparagoides</i> (bridal creeper, florist's smilax)	W-d	VH	W-d	VH
<i>Aster subulatus</i> (wild aster, bushy starwort, aster weed)	NP?		W-s	L
<i>Axonopus fissifolius</i> (narrow-leaved carpet grass)			W-s	L
<i>Baccharis halimifolia</i> (groundsel bush)	NP		NP	
<i>Bidens pilosa</i> (cobblers pegs, pitch-forks)	W-d	L	W-d	L
<i>Briza maxima</i> (quaking grass, giant shivery grass)	W-d	L	W-s	L
<i>Briza minor</i> (shivery grass, small shivery grass, quaking grass)	W-s	L	W-s	L
<i>Bromus diandrus</i> (great brome)			W-s	L
<i>Bryophyllum delagoense</i> (mother of millions)	W-d	H	W-s	VH
<i>Cardiospermum grandiflorum</i> (balloon vine)	W-d	VH	W-d	VH
<i>Celtis australis</i>	L		E	
<i>Cenchrus ciliaris</i> (buffel grass)	L		NP	
<i>Cestrum parqui</i> (green cestrum, green poisonberry)	W-d	VH	W-d	VH
<i>Chloris gayana</i> (Rhodes grass)	W-d	L	W-s	L
<i>Chrysanthmoides monillifera</i> subsp. <i>rotunda</i> (bitou bush)	W-d	VH	W-d	VH
<i>Cinnamomum camphora</i> (camphor laurel)	W-s	M	W-s	VH
<i>Cirsium vulgare</i> (spear, black, Scotch thistle)	W-s	L	W-s	L
<i>Conyza</i> spp.	W-d	L	W-d	M
<i>Coprosma repens</i> (taupata, New Zealand laurel)	W-s	M	L	
<i>Coreopsis lanceolata</i> (coreopsis, tickseed)	W-d	L	W-s	M
<i>Cyperus eragrostis</i> (umbrella sedge)	W-s	H	W-d	H
<i>Dactylis glomerata</i> (cocksfoot)	W-s	L	W-s	L
<i>Duchesnea indica</i>			L	
<i>Echinochloa crus-galli</i> (barnyard grass)	W-s	L	W-s	L

Primary list of weeds considered at workshops	Parramatta		Hurstville	
	D ¹	I ²	D ¹	I ²
<i>Ehrharta calycina</i> (perennial veldtgrass)	W-d	L	NP	
<i>Ehrharta erecta</i> (panic veldtgrass)	W-d	H	W-d	VH
<i>Eragrostis curvula</i> (African lovegrass)	W-d	H	W-d	VH
<i>Erythrina crista-galli</i> (cockspur coral tree)	W-s	H	W-s	L
<i>Gamochaeta</i> spp. (cudweeds)	L		W-s	L
<i>Gazania rigens</i> (treasure flower)	W-d	H	L	
<i>Gleditsia triacanthos</i> (honey locust)	L		L	
<i>Gloriosa superba</i> (glory lily, climbing lily)	L		L	
<i>Hedychium gardnerianum</i> (kahili ginger, ginger lily)	W-s	M	L	
<i>Holcus lanatus</i> (Yorkshire fog)	L		L	
<i>Hydrocotyle bonariensis</i> (large-leaf pennywort)	W-d	H	W-d	H
<i>Hypericum perforatum</i> (St John's wort)	W-d	L	W-s	M
<i>Hypochaeris radicata</i> (catsear, flatweed)	W-s	L	W-s	L
<i>Impatiens walleriana</i>	W-s	M	W-s	L
<i>Ipomoea cairica</i> (coastal morning glory, mile a minute)	W-d	VH	W-d	VH
<i>Ipomoea indica</i> (blue morning glory)	W-d	VH	W-d	VH
<i>Ipomoea purpurea</i> (common morning glory)	W-d	VH		
<i>Juncus acutus</i> (spiny rush, spike rush, sharp rush)	W-d	VH	L	
<i>Juncus articulatus</i> (joint rush)	W-d	VH	L	
<i>Lantana camara</i> (lantana)	W-d	VH	W-d	VH
<i>Ligustrum lucidum</i> (large-leaf privet)	W-d	VH	W-d	VH
<i>Ligustrum sinense</i> (small-leaf privet, Chinese privet)	W-d	VH	W-d	VH
<i>Lilium formosanum</i> (Formosa lily, tiger lily)	L		W-s	L
<i>Lolium perenne</i> (perennial ryegrass)	W-s	L	W-s	L
<i>Lonicera japonica</i> (Japanese honeysuckle)	W-d	H	W-d	VH
<i>Lycium ferocissimum</i> (African boxthorn)	W-s	H	W-s	H
<i>Marrubium vulgare</i> (white horehound)			NP	
<i>Nassella neesiana</i> (Chilean needle grass)	E		E	
<i>Olea europaea</i> (common olive, African olive)	W-d	VH	W-d	VH
<i>Opuntia</i> spp. (prickly pears)	W-s	M	L	
<i>Parapholis incurva</i> (coast barb grass, curved sickle-grass)	L		NP	
<i>Parietaria judaica</i> (pellitory, asthma plant)	W-d	M	W-d	M
<i>Paspalum dilatatum</i> (paspalum)	W-d	M	W-s	M
<i>Paspalum urvillei</i> (Vasey grass, paspalum)	W-d	M	W-s	M
<i>Passiflora subpeltata</i> (white passionflower)	L		L	
<i>Pennisetum clandestinum</i> (kikuyu)	W-d	H	W-d	VH
<i>Pennisetum villosum</i> (feathertop, white foxtail)	W-d	M	W-s	H
<i>Phalaris aquatica</i> (bulbous canary grass, phalaris)	W-d	M	W-s	L
<i>Phyla canescens</i> (lippia)			NP	
<i>Physalis peruviana</i> (cape gooseberry)	NP		L	
<i>Plantago coronopus</i> (buck's-horn plantain)	W-s	L	NP	
<i>Plantago lanceolata</i> (narrow-leaf plantain, lamb's tongues)	W-s	L	W-s	L

Primary list of weeds considered at workshops	Parramatta		Hurstville	
	D ¹	I ²	D ¹	I ²
<i>Polypogon monspeliensis</i> (annual beardgrass, rabbitsfoot grass)			L	
<i>Pyracantha angustifolia</i> (orange firethorn)	NC		L	
<i>Pyracantha crenatoserrata</i>	NC		L	
<i>Pyracantha crenulata</i>	NC		L	
<i>Pyracantha</i> spp. (orange firethorn)	L		NC	
<i>Ranunculus repens</i> (creeping buttercup)	W-s	M	W-s	H
<i>Ricinus communis</i> (castor oil)	W-d	M	W-s	H
<i>Rosa rubiginosa</i> (sweet briar, briar rose, eglantine)	L		L	
<i>Rubus ellipticus</i> (yellow raspberry)	L		L	
<i>Rubus fruticosus</i> agg. (blackberry)	W-d	VH	W-d	VH
<i>Rubus laciniatus</i> (cut-leaf blackberry)	NP		NP	
<i>Rubus roribaccus</i> (north American dewberry)			NP	
<i>Sagittaria graminea</i> spp. <i>platyphylla</i> = <i>Sagittaria platyphylla</i> (arrow head)	W-s	?M	E	
<i>Salix</i> spp. (willow)	W-s	H	W-d	VH
<i>Senecio madagascariensis</i> (fireweed)	W-d	L	W-s	M
<i>Senna didymobotrya</i> (cassia, senna (smooth))	W-d	H	NP	
<i>Senna septemtrionalis</i> (foxtail millet)	NP		NP	
<i>Sida rhombifolia</i> (Paddy's lucerne)	W-d	L	W-d	H
<i>Solanum mauritianum</i> (wild tobacco plant)	W-s	L	W-s	L
<i>Solanum nigrum</i> (blackberry nightshade)	W-d	L	W-d	L
<i>Solanum pseudocapsicum</i> (Madeira winter cherry)	W	L	W-d	M
<i>Solanum seafortianum</i> (three-flowered nightshade)	NP		W-s	M
<i>Sonchus oleraceus</i> (common sowthistle)	W-d	L	W-s	L
<i>Sporobolus fertilis</i> (giant Parramatta grass)	L		L	
<i>Stenotaphrum secundatum</i> (buffalo grass, soft buffalo)	W-d	H	W-s	H
<i>Taraxacum officinale</i> (dandelion, pissabed)	W-d	L	W-s	L
<i>Thunbergia alata</i> (black-eyed Susan vine)	L		W-s	H
<i>Tradescantia fluminensis</i> (trad)	W-d	VH	W-d	VH
<i>Verbena bonariensis</i> (purpletop)	W-d	L	W-s	H
<i>Veronica anagallis-aquatica</i> (blue water speed-well)			E	
<i>Vicia sativa</i> (spring vetch)	W-s	L	W-s	M
<i>Vinca major</i> (blue periwinkle, greater periwinkle)	W-d	H	W-s	H
<i>Vulpia myuros</i> (rat-tailed fescue)	W-d	L	W-s	L
<i>Xanthium occidentale</i> (Noogoora burr, cockle burr)	W-d	L	L	

¹Distribution (D) abbreviations: W = widespread (s = sparse d = dense); L = localised; NP = not present; E = emerging; A = alert.

²Impact (I) abbreviations: VH = Very High; H = high; M = medium; L = low.
NC = species that were not considered at workshops. ? = unsure.

Blank cells represent species that were not considered at workshops.

Table L9. Weeds added by workshop participants in the SMCMA region.

Weeds added by workshop participants	Parramatta		Hurstville	
	D ¹	I ²	D ¹	I ²
<i>Acacia baileyana</i> (Cootamundra wattle)	L		W	L
<i>Acacia podylarifolia</i> (Queensland silver wattle)			W	L
<i>Acer negundo</i> (box elder)			L	
<i>Ailanthus altissima</i> (tree of heaven)	W	H		
<i>Ambrosia tenuifolia</i>			L	
<i>Arundo donax</i>	W	H		
<i>Asparagus plumosus</i> (climbing asparagus fern)			W	VH
<i>Asparagus scandens</i> (asparagus fern)			W	VH
<i>Asphodelus fistulosus</i> (onion weed)	W	L		
<i>Atriplex prostrata</i>			W-s	L
<i>Brassica</i> sp. (brassica)	W	L		
<i>Briza subcaristida</i>			W-d	M
<i>Caesalpinia giliesii</i> (bird of paradise)	W	L		
<i>Chasmanthe floribunda</i>	L			
<i>Chlorophytum comosum</i> (spider plant)			W-s	VH
<i>Cortaderia selloana</i> (pampas grass)	W	H		
<i>Cotoneaster</i> sp. (cotoneaster)	L			
<i>Crassula</i> spp.	W	M		
<i>Crococsmia</i> x <i>crococsmiiflora</i> (montbretia)	L			
<i>Cyperus congestus</i>			W	M
<i>Cyperus rotundus</i> (nutgrass)	W	L	W	L
<i>Delairea odorata</i> (Cape ivy)	W	VH	W	H
<i>Digitaria ciliaris</i> (summer grass)			W	L
<i>Digitaria didactyla</i> (Queensland blue couch)			W	H
<i>Dipogon lignosus</i> (dipogon)			W	H
<i>Echium plantagineum</i> (Paterson's curse)	W	L		
<i>Egeria densa</i> (dense waterweed)			W-d	VH
<i>Erythrina sykesii</i>	W	H		
<i>Fallopia japonica</i> (Japanese knotweed)	W	L		
<i>Foeniculum vulgare</i> (fennel)	W	L		
<i>Genista monspessulana</i> (Cape/Montpellier broom)			W	H
<i>Grevillia robusta</i>	W	L		
<i>Hedera helix</i> (English ivy)			W	H
<i>Hyparrhenia hirta</i>			E	
<i>Isolepis prolifera</i>			L	
<i>Ludwigia peruviana</i>	W		E	
<i>Nephrolepis cordifolia</i> (fishbone fern)	W	VH	W-d	VH
<i>Nerium oleander</i> (oleander)	L			
<i>Macfadyena unguis-cati</i> (cat's claw creeper)			W	VH
<i>Melalis repens</i>			W-s	M

Weeds added by workshop participants	Parramatta		Hurstville	
	D ¹	I ²	D ¹	I ²
<i>Ochna serrulata</i> (ochna, Mickey Mouse weed)	W	VH	W	VH
<i>Oenothera</i> spp. (evening primrose)	W	M		
<i>Panicum maxim</i> (Guinea grass)			L	
<i>Paraserianthes lophantha</i> (albizia, crested wattle)			W	H
<i>Paspalum quadrifarium</i> (blue grass)			W-d	VH
<i>Passiflora edulis</i> (common passionfruit)			W	H
<i>Pennisetum setaceum</i>			E	
<i>Persicaria capitata</i> (Japanese knotweed)			W	M
<i>Phyllostachus</i> spp. (bamboo)	W	VH		
<i>Phytolacca octandra</i> (inkweed)	W	L		
<i>Pinus radiata</i>	W	L		
<i>Poa annua</i> (winter grass)	W	L		
<i>Polygala myrtifolia</i> (polygala)			W	M
<i>Salpichroa organifolia</i>			E	
<i>Senna floribunda</i>			W-s	M
<i>Senna pendula</i> (senna)			W-d	VH
<i>Setaria gracilis</i> (slender pigeon grass)			W	L
<i>Setaria palmifolia</i> (palm grass)			W	M
<i>Setaria pumila</i> (pale pigeon grass)			W	L
<i>Setaria</i> spp. (pigeon grass)	W	L		
<i>Sporobolus africanus</i> (Parramatta grass)			W	M
<i>Verbena</i> spp.	W	L		
<i>Watsonia meriana</i> var. <i>bulbillifera</i> (watsonia)	W	H		
<i>Xanthium spinosum</i> (Bathurst burr)	W	L		

¹Distribution (D) abbreviations: W = widespread (s = sparse d = dense); L = localised; E = emerging.

²Impact (I) abbreviations: VH = Very High; H = high; M = medium; L = low.

NC = species that were not considered at workshops. ? = unsure.

Blank cells represent species that were not considered at workshops.

**APPENDIX L4.
TEMPLATE OF LETTER SENT TO PRIVATE LANDHOLDERS WITH
VOLUNTARY CONSERVATION AGREEMENTS OR WILDLIFE REFUGES
ON THEIR PROPERTIES**

Date

Address

Dear

Did you know that weeds are one of the biggest threats to our native plants and animals in Australia?

Our colleagues in the Pest Management Unit are currently running a project to identify priority sites where priority widespread weeds are threatening biodiversity across all land tenures. At a series of workshops recently, a list of high priority widespread weeds impacting on biodiversity within the Sydney Metropolitan Catchment was established (see overleaf).

The project is now identifying the location of these priority weeds within the Catchment. This information will be collated into a database and will help direct investment in weed control for biodiversity conservation. Funding for weed control at priority sites may become available through the project.

Being landholders with biodiversity of high conservation value, you are invited to take part in the project. If one or more of the weeds listed below are threatening biodiversity on your land you are eligible to nominate a site, or a number of sites on your property and potentially receive funding for weed control.

All you need to do is complete the attached site nomination form and return it by Thursday 24 April. Information from site nominations, as well as existing biodiversity knowledge within the region, will be used to rank sites for weed control funding. If you wish to be considered for the weed control aspect of the project and the funding assistance, please indicate if, as a landholder in the Conservation Partners Program, you have previously received funding for weed control on your property and details of the scope of the work undertaken.

Please follow the instructions attached to the form and complete and return the data use agreement. If you have any questions about how to nominate a site or fill in the form, wish to receive an electronic copy of the forms to complete or require more information, contact the project officer on 9585 6837 or weeds.cma@environment.nsw.gov.au.

Please complete the form to the best of your knowledge. If you are unsure of how to address any of the fields then indicate 'Further Information Required'.

You can also find out more about the project by visiting:

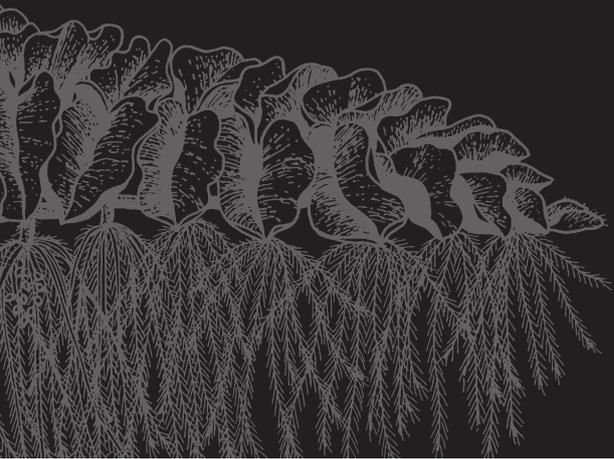
www.environment.nsw.gov.au/cmaweeds

Yours sincerely

Sally Ash

Conservation Partners Program Coordinator

Parks and Wildlife Group



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