

WEEDS OF NATIONAL SIGNIFICANCE

Blackberry

(*Rubus fruticosus* L. agg.)

strategic plan 2012–17

This publication is produced as part of the Weeds of National Significance initiative, a joint initiative between the Commonwealth of Australia and each of the Australian states and territories.

© Commonwealth of Australia 2012

ISBN 978-1-921575-70-9 (online)

This work is licensed under the Creative Commons Attribution 3.0 Australia Licence. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/3.0/au>.

Published by the Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

The Australian Government and the Australian Weeds Committee (AWC) support and encourage the dissemination and exchange of publicly funded information. The Creative Commons Attribution 3.0 Australia Licence applies to all material in this publication save for the content supplied by third parties, the Department of Agriculture, Fisheries and Forestry logo, the Commonwealth Coat of Arms, and any material protected by trademark. Where the material in the publication is owned by a third party, you should contact the copyright owner before making any use of that material outside what is permitted under the Copyright Act 1968.

While every care has been taken in preparing this publication, the AWC accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this report.

An unpublished draft of the revised strategic plan has guided national coordination of this Weed of National Significance for the past two years. Before publishing the revised plan, the Australian Weeds Committee altered it because some actions had been completed, and then agreed to include a uniform monitoring, evaluation, reporting and improvement (MERI) template for all phase-3 Weeds of National Significance.

Supporting information about the Australian Weeds Strategy, Weeds of National Significance and progress to date may be found at www.weeds.org.au, where links and downloads provide contact details for all species and copies of the strategy. Comments and constructive criticism are welcomed as an aid to improving the process and future revisions of this strategy.

This publication (and any material sourced from it) should be attributed as:

Australian Weeds Committee 2012, *Blackberry (Rubus fruticosus L. agg.) strategic plan 2012–17*, Weeds of National Significance, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

Inquiries should be addressed to:

Secretariat
Australian Weeds Committee
GPO Box 858
CANBERRA ACT 2601

Email: awc@daff.gov.au

Web: www.weeds.org.au

Copies of this publication are available from the Secretariat or at www.weeds.org.au/wons.

Contents

Summary	v
1 The challenge	1
1.1 Complexity of the <i>Rubus</i> genus in Australia	1
1.2 Blackberry control	1
2 Background	2
2.1 <i>Rubus</i> species in Australia	2
2.2 Biology of blackberry.....	3
2.3 History of introductions	5
2.4 Summary of impacts and benefits.....	5
2.4.1 Impacts	5
2.4.2 Benefits.....	5
2.5 Control options.....	5
2.5.1 Biological control.....	5
2.5.2 Socioeconomic factors	6
2.6 Legislation.....	6
2.7 Principles underlying the plan.....	8
2.7.1 Achievements to date	9
2.7.2 Process followed	11
2.8 Relevance to other strategies	12
3 Strategic goals	13
3.1 A new direction	13
3.2 Goals and objectives.....	13
3.3 Responsible partners and resourcing.....	14
3.4 Prioritisation	14
3.5 Goal 1: Prevent new infestations from establishing	15
3.6 Goal 2: Strategically manage existing infestations.....	16
3.7 Goal 3: Increase the capability and commitment to effectively manage blackberry.....	18

4	Monitoring, evaluation, reporting and improvement framework.....	20
5	Stakeholder responsibilities	24
Appendix 1	Distribution and origin of <i>Rubus</i> species recorded in Australia.....	25
Appendix 2	The Weeds of National Significance initiative and its phases	28
Appendix 3	Program logic model for the blackberry strategic plan.....	29
Glossary.....		30
References.....		31

Summary

European blackberry¹ (*Rubus fruticosus* L. agg.) has been designated a Weed of National Significance (WoNS).

Blackberries are a serious weed throughout temperate Australia, threatening both agricultural and natural ecosystems. The economic cost (excluding social and biodiversity costs) of blackberries is high; the latest estimate is that annual production losses and costs of blackberry control amount to at least \$70 million (Weeds CRC 2006).

This strategic plan aims to build on the achievements from the 2001–2006 Blackberry Strategic Plan and maintain the momentum that has already been gained through national coordination. It has three goals, which set the future direction and address the challenges for blackberry management. The strategic plan focuses on holistic management of blackberries and therefore recognises some blackberry groups outside the *R. fruticosus* aggregate—this is a new direction for the strategic plan.

The three goals of the 2012–17 strategic plan are as follows:

1 Prevent new infestations from establishing.

Goal 1 aims to prevent the establishment of uncommon species of blackberry and address outlier infestations for which eradication can still be achieved. Education on the *Rubus* genus and training in identification will be important in achieving this goal.

2 Strategically manage existing infestations.

Goal 2 sets the direction for on-ground management of established blackberry infestations. It identifies situations in which a management approach involving containment or asset protection is required, and encourages removal of satellite infestations or a reduction in blackberry distribution, where feasible. This goal also highlights activities that should occur to support decision making and improve management outcomes.

3 Increase the capability and commitment to effectively manage blackberry.

Goal 3 builds and maintains commitment to the long-term management of blackberry, while ensuring that the best possible tools and methods for control are available, widely communicated and used. This goal also ensures that the critical role of the community in blackberry management is recognised.

Implementation of the Blackberry Strategic Plan 2012–17 will minimise the spread of blackberries and reduce the impact of infestations across Australia.

Vision

Blackberry is managed effectively to prevent spread and reduce impact across Australia.

1 The terms ‘blackberry’ and ‘blackberries’ are used in this strategic plan to refer to all taxa within the *Rubus fruticosus* L. aggregate and other invasive blackberries.

1 The challenge

Blackberry management throughout Australia faces a number of major challenges, as a result of its ability to spread and grow in many different situations, as well as the complex taxonomy of the genus *Rubus* in Australia. The 2001–06 National Blackberry Strategic Plan dealt with the *R. fruticosus* aggregate (European blackberry). Other species of the *Rubus* genus (of North American or Asian origin) are also of concern to land managers in Australia.

1.1 Complexity of the *Rubus* genus in Australia

In addition to the well known ‘weedy’ European blackberry, *Rubus* species of North American and Asian origin, cultivars used for commercial purposes and native *Rubus* all occur in Australia. The complexity of the *Rubus* genus in Australia poses several management challenges:

- Some taxa of North American and Asian origin have been found to be invasive and will require control, although these are not officially recognised as Weeds of National Significance (WoNS).
- Commercial cultivars of *Rubus* are complex—they were developed from a diverse range of taxa, including some of mixed European and American origin. Balancing the commercial and management requirements of the different *Rubus* species in Australia needs to be underpinned by a sound knowledge of the taxonomy of *Rubus*.
- Management programs and control methods need to be targeted to the right species in the right situations. This is particularly the case for biological control. Current biological controls affect only species of European origin, and any future biological control must ensure protection of native *Rubus* species and the *Rubus* industry.

1.2 Blackberry control

Major control challenges for managing invasive blackberries in Australia include the following:

- Since blackberry is able to reproduce and spread both by seed and vegetatively, it can spread easily.
- Regrowth of blackberry post-control is common because it takes time to effectively kill or remove the root and crown (blackberry has a perennial root system that can produce new canes, and produce root suckers from a depth of at least 45 centimetres). Follow-up treatments are essential to achieving success. This means that control of blackberry is a long-term process—it cannot be achieved with a one-off effort.
- Blackberry can occur in agricultural areas where the economic value of the land is less than the cost of controlling infestations. This can be a deterrent to management.
- Large, dense thickets formed by blackberry can make access to infestations difficult. Integrating different control techniques is the main way to overcome this barrier.
- Blackberry is capable of growing in areas that cannot easily be accessed by people, making control and rehabilitation in these situations extremely difficult.

2 Background

European blackberry is considered a WoNS in Australia because of the extent of its negative impacts. First introduced to Australia in the 1830s, *Rubus* species originating in Europe, North America and Asia have now become naturalised and infest land from south-east Queensland to southern Tasmania, as well as in south-west Western Australia.

Species in the *R. fruticosus* aggregate infest about 8.8 million hectares of land in Australia (see Figure 1a). They are considered weeds in all states and territories except the Northern Territory. These species are mostly restricted to temperate climates (warm summers, cool winters) with an annual rainfall of at least 700 millimetres. However, they can grow in lower rainfall areas when other environmental conditions are favourable (e.g. along the banks of waterbodies). They can occur at any altitude in Australia.

Some species in the *R. fruticosus* aggregate are thought to have reached their potential range in Australia, based on our knowledge of rainfall and temperature tolerances (see Figure 1b). However, other species still have the potential to expand their range.

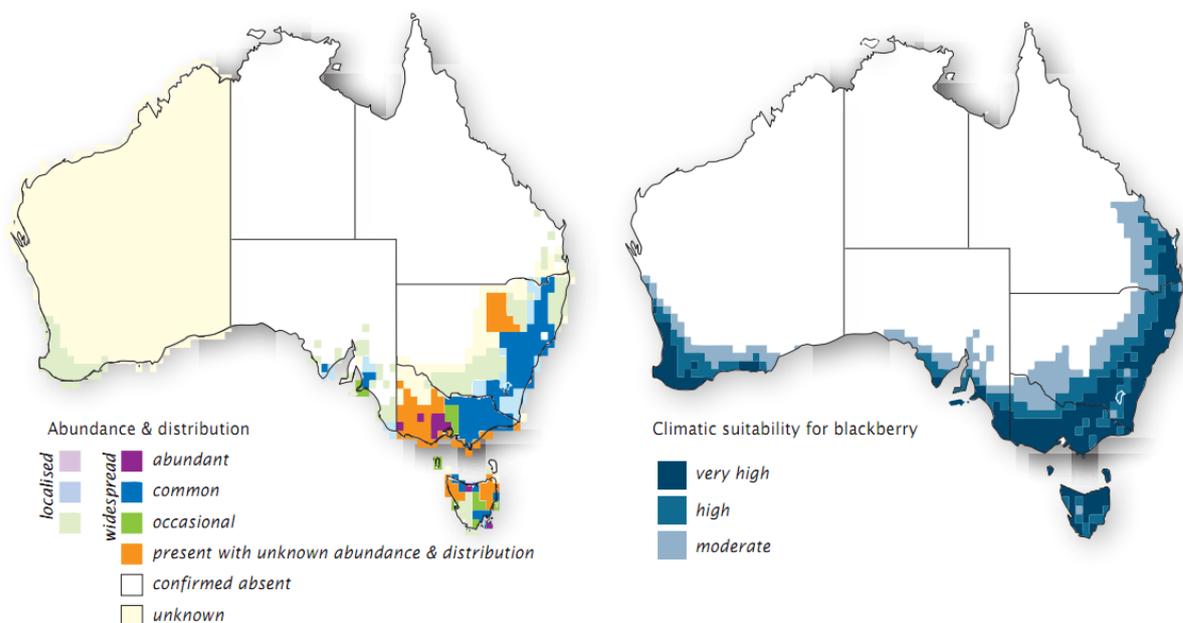


Figure 1 a) Current known distribution of European blackberry in Australia (NLWRA 2008). b) Potential distribution of European blackberry in Australia, using CLIMATE modelling system (DPI Victoria 2011)

2.1 *Rubus* species in Australia

A number of other blackberry species of concern that are outside the *R. fruticosus* aggregate also occur in Australia, along with commercial cultivars and native *Rubus*. These can be broken into four main 'groups':

- *R. fruticosus* aggregate (European blackberry)—these species are a WoNS and are the focus of many blackberry control programs throughout Australia
- other introduced *Rubus* taxa (of North American and Asian origin)—these species are not technically considered as WoNS, but some are invasive and are the focus of control programs in different areas of Australia

- native *Rubus*—the ability to distinguish native from introduced *Rubus* is important
- commercial cultivars of *Rubus*, which can be of mixed origin.

For further information on the *Rubus* species present in Australia and their identification, refer to the *Blackberry control manual* (NSW Department of Primary Industries 2009) and Appendix 1.

The *Rubus* industry in Australia is led by the Australian Rubus Growers Association Inc. (ARGA), the peak industry body representing *Rubus* and *Ribes* growers throughout Australia. ARGA has developed a strategic plan (Gray 2009), which seeks to expand the *Rubus* industry by doubling production over the five-year period to 2014 by addressing the following priorities:

- increase the consumption of *Rubus* fruit
- maintain the Industry Development Manager position
- reduce nursery risk (and improve growers' access to dependable sources of nursery canes)
- continue variety evaluation (to provide new varieties that can increase commercial success)
- improve agronomic knowledge (and growers' access to this information).

It is important that partnerships formed between the National Blackberry Taskforce (on behalf of managers of weedy blackberry) and the *Rubus* industry continue, to ensure that there is a balanced approach to management, research and the commercial benefits of *Rubus* in Australia. Understanding the taxonomy of *Rubus* in Australia will be important in achieving this balanced approach.

2.2 Biology of blackberry

Blackberry has a two-year growth pattern, as shown in Figures 2 and 3, and Table 1. It is a scrambling, semi-prostrate to almost erect plant, with biennial canes (stems) and a perennial root system. It can reproduce and spread both vegetatively (by propagating from cane tips) and by seed (spread by fruit-eating birds and mammals, and via water).

Table 1 Life-cycle events of blackberry in temperate southern Australia

	Winter			Spring			Summer			Autumn		
	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Germination				■	■	■	■					
Flowering (2 years old)						■	■	■	■			
Fruiting (2 years old)							■	■	■	■	■	
Tip rooting (1 year old)	■	■								■	■	■
Drought stress							■	■	■	■		
Dormancy	■	■	■									

Note: The shading denotes relative importance—dark is more important and light less important.

Source: Bruzese & Lane (1996).

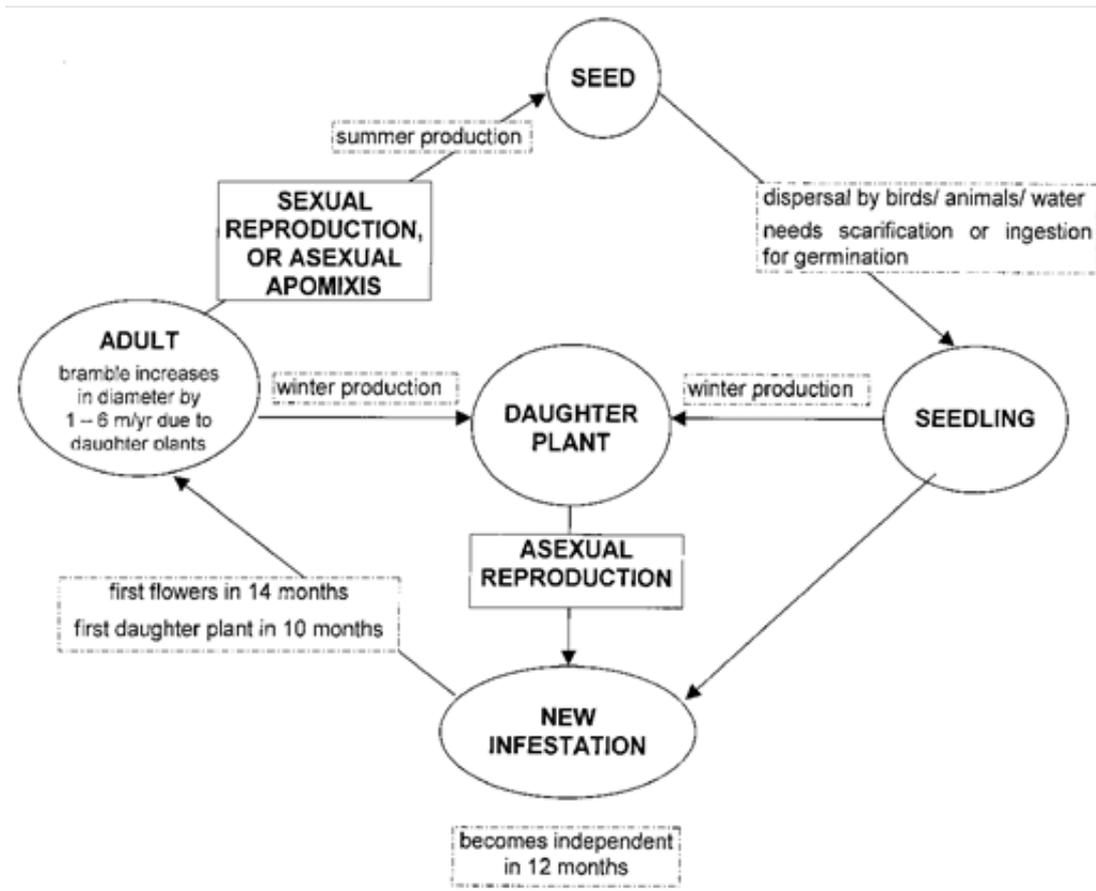


Figure 2 Blackberry life cycle

Source: Bruzzese & Lane (1996)

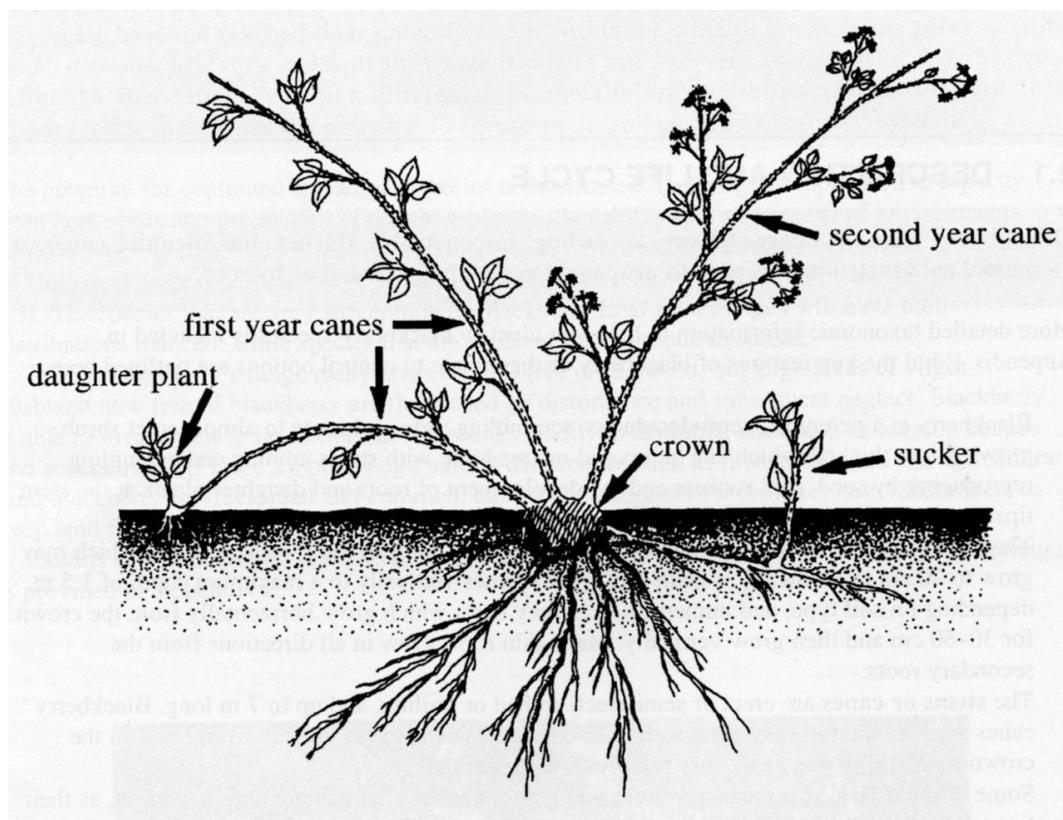


Figure 3 Blackberry growth and reproductive morphology()

2.3 History of introductions

There is evidence that blackberry was planted in New South Wales by the late 1830s. In 1842, blackberry was first recorded as being deliberately introduced from Europe to Adelaide for its fruit. It was included in the sale catalogue of a Tasmanian nursery by 1845. Blackberry was recognised as a significant weed by the 1880s, and first proclaimed a noxious weed in a region of Gippsland (Victoria) in 1894. There is some evidence that it was introduced independently into Western Australia (ARMCANZ et al. 2000).

2.4 Summary of impacts and benefits

2.4.1 Impacts

The impacts of blackberry are well documented and numerous. Blackberry grows vigorously and can infest a large area quickly, smothering other vegetation. Once established, it causes major problems: it can reduce primary production, degrade natural environments (including reducing biodiversity), restrict access to land and water for both animals and humans, harbour vermin, and become a fire hazard. It has recently been estimated that annual production losses and control costs amount to at least \$70 million (Weeds CRC 2006).

2.4.2 Benefits

Blackberry also has benefits in Australia. There is a commercial industry for *Rubus* in Australia, and some in the community enjoy recreational fruit picking of blackberry. Pollen and nectar can be an important resource for local honey production. Thickets can provide protection for native animals, such as birds and bandicoots, and fruit is a food source for some animals, both native and exotic.

For more detailed information on the impacts and benefits of blackberry, refer to the *Blackberry control manual* (NSW Department of Primary Industries 2009).

2.5 Control options

A large range of options are available for managing blackberry, including herbicide, physical and biological controls. Rarely will one single control option used in isolation succeed, and the effectiveness of these options varies in different situations and for different taxa. A control program should be well planned to consider all the available management options and to ensure that they are appropriately integrated for maximum control in each situation.

Detailed information on each of the control practices can be found in the *Blackberry control manual* (NSW Department of Primary Industries 2009).

2.5.1 Biological control

Currently, the only biological control agent tested and released in Australia is leaf rust fungus (*Phragmidium violaceum*), which attacks only European blackberry. The rust spreads by natural means and, where environmental conditions are suitable, will infect and cause damage on blackberry. There is evidence of the effectiveness of the leaf rust fungus in controlling blackberry in some regions but quantitative data is limited. The future direction for blackberry biological control is uncertain. For this reason, this strategic plan calls for a review of the biological control of blackberry (strategic action 3.2.1) place before any further research occurs. This review should include a review of the effectiveness of the leaf rust fungus in Australia and an assessment of whether other biological control options could be investigated.

It is recommended that a full review of blackberry biological control takes.

2.5.2 Socioeconomic factors

Because blackberry is such an invasive and competitive weed, controlling it provides benefits to land managers and the community. Some land managers do not have the skills, motivation, money or infrastructure to adopt best-management strategies, and therefore have reduced options for control. Blackberry also occurs in agricultural areas where the economic value of the land may be below the costs of controlling infestations.

In some areas with blackberry infestations, the primary impact is environmental, and this affects management funding priorities, which also include other (agricultural) weeds. Some members of the community oppose herbicide spraying, on the grounds that children and, to a lesser extent, adults may eat the fruit of treated plants. In rare instances, this prevents the use of herbicides as a control option.

Rubus species also bring economic benefits through the commercial *Rubus* industry and honey production.

2.6 Legislation

Blackberry legislation, which varies between the states and territories, focuses on the *R. fruticosus* aggregate. It ranges from a minimum of the aggregate being banned from sale to the requirement to eradicate any plants that are found. In some states and territories, other blackberry taxa (outside the *R. fruticosus* agg.) are also declared as noxious weeds. To protect the commercial industry, particular cultivars of blackberry are permitted. A summary of this legislation is provided in Table 2.

Table 2 Legislation for blackberry in Australia

Jurisdiction	Legislation	Declaration	Permitted taxa (cultivars, varieties)
Commonwealth	<i>Quarantine Act 1908</i>	All nursery stock and seeds of the species collectively grouped as <i>R. fruticosus</i> agg. are banned from entry into Australia, along with <i>R. longepedunculatus</i> , <i>Rubus</i> 'Brazos' and <i>Rubus</i> 'Tupi'	Some cultivars (see ICON database at www.aqis.gov.au/icon32/asp/homecontent.asp)
Australian Capital Territory	<i>Pest Plants and Animals Act 2005</i>	Plants of any of the <i>R. fruticosus</i> agg. species must be contained, and propagation and supply are prohibited	'Black Satin', 'Chehalem', 'Chester Thornless', 'Dirksen Thornless', 'Loch Ness', 'Murrindindi', 'Silvan', 'Smoothstem' and 'Thornfree'
New South Wales	<i>Noxious Weeds Act 1993</i>	All <i>R. fruticosus</i> agg. species are Class 4 weeds—growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority, and the plant may not be sold, propagated or knowingly distributed	'Black Satin', 'Chehalem', 'Chester Thornless', 'Dirksen Thornless', 'Loch Ness', 'Murrindindi', 'Silvan', 'Smoothstem' and 'Thornfree'
Queensland	<i>Land Protection (Pest and Stock Route Management) Act 2002</i>	<i>R. anglocandicans</i> and <i>R. fruticosus</i> agg. are declared as Class 3 plants. It is an offence to introduce, release, give away, sell or otherwise supply a Class 3 pest. Control may be required in some situations	
Northern Territory	<i>NT Weeds Management Act 2001</i>	Species in the <i>R. fruticosus</i> agg. are both Class A weeds (eradicated if found) and Class C weeds (not to be introduced). These species are also prohibited from sale	
South Australia	<i>Natural Resources Management Act 2004</i>	Movement and sale of species in the <i>R. fruticosus</i> agg. are prohibited, and control is required in a number of local government areas	'Black Satin', 'Chester Thornless', 'Dirksen Thornless', 'Loch Ness', 'Smoothstem' and 'Thornfree' ^a
Tasmania	<i>Weed Management Act 1999</i>	Import, sale, and trade of species in the <i>R. fruticosus</i> agg.—including <i>R. anglocandicans</i> , <i>R. erythrops</i> , <i>R. echinatus</i> , <i>R. laudatus</i> , <i>R. leucostachys</i> , <i>R. polyanthemus</i> , <i>R. vestitus</i> , <i>Rubus</i> sp. (Tasmania) and <i>R. laciniatus</i> —are prohibited. These species are an eradication target in the municipalities of Flinders Island and King Island and containment targets in all other municipalities	Commercial varieties of blackberry
Victoria	<i>Catchment and Land Protection Act 1994</i>	<i>R. fruticosus</i> agg. is declared restricted (no sale, trade, transport or display) in the Mallee Catchment Management Authority (CMA) region and is regionally controlled (to prevent growth and spread) in all other CMA regions	
Western Australia	<i>Agriculture and Related Resources Protection Act 1976</i>	The legislative arrangements are currently in a transition from the <i>Agriculture and Related Resources Protection Act 1976</i> to the <i>Biosecurity and Agriculture Management Act 2007</i> (BAM Act)	<i>Rubus strigosus</i> , <i>R. loganobaccus</i> , <i>R. corchorifolius</i> , <i>R. idaeus</i> × hybrids, <i>R. ursinus</i> × hybrids, <i>R. allegheniensis</i> × hybrids, <i>R. frondosus</i> , <i>R. argutus</i> × hybrids, <i>R. parvifolius</i>

Jurisdiction	Legislation	Declaration	Permitted taxa (cultivars, varieties)
Western Australia (continued)	<i>Biosecurity and Agriculture Management Act 2007</i>	Under the BAM Act, it is proposed that the following <i>Rubus</i> species will be declared throughout Western Australia: <i>R. anglocandicans</i> , <i>R. fruticosus</i> , <i>R. laudatus</i> , <i>R. rugosus</i> and <i>R. ulmifolius</i> . It is likely they will be declared C3 (management), for the whole of the state; this will prohibit the trade, sale or movement of plants or their seeds into the state and within the state	<i>Rubus probus</i> , <i>R. asperifolius</i> , <i>R. australis</i> , <i>R. biflorus</i> , <i>R. calycinus</i> , <i>R. crataegifolius</i> , <i>R. delavayi</i> , <i>R. edulis</i> , <i>R. geoides</i> , <i>R. hawaiiensis</i> , <i>R. hayata-koidzumii</i> , <i>R. lineatus</i> , <i>R. mulleri</i> , <i>R. pentalobus</i> , <i>R. praecox</i> , <i>R. setchuenensis</i> , <i>R. splendens</i> , <i>R. squarrosus</i> , <i>R. taiwanicola</i> , <i>R. tephrodes</i> , <i>R. hibetanus</i> , <i>R. ursinus</i> × <i>idaeus</i> , <i>R. gunnianus</i> , <i>R. nebulosus</i> , <i>R. parviflorus</i>

a Cultivars permitted when planted and maintained for domestic or commercial purposes under conditions approved by the designated minister.

Source: Adapted from the *Blackberry control manual* (NSW Department of Primary Industries 2009)

2.7 Principles underlying the plan

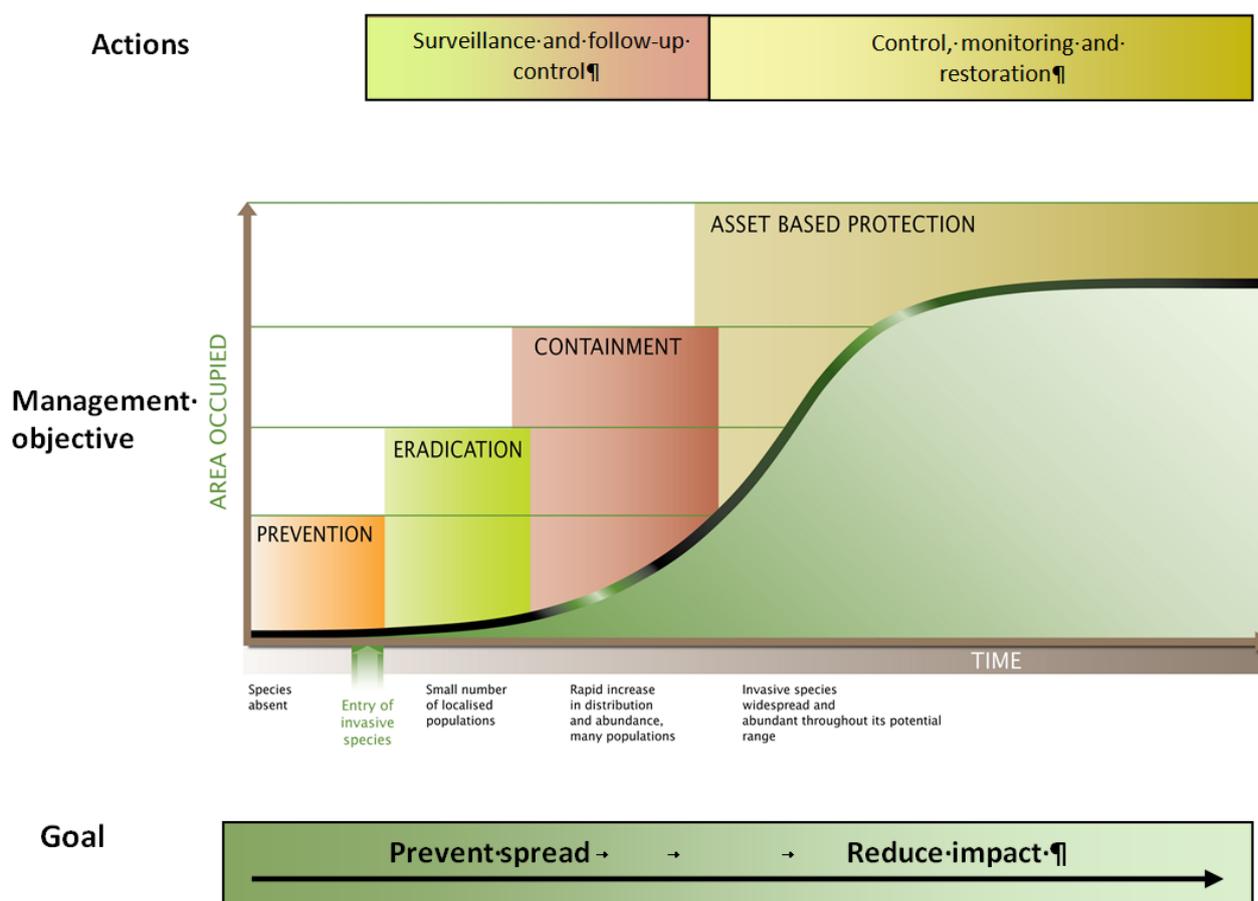
This strategic plan is based on the seven key principles of the Australian Weeds Strategy (NRMCC 2007):

- Weed management is an essential and integral part of the sustainable management of natural resources for the benefit of the economy, the environment, human health and amenity.
- Combating weed problems is a shared responsibility that requires all parties to have a clear understanding of their roles.
- Good science underpins the effective development, monitoring and review of weed management strategies.
- Prioritisation of, and investment in, weed management must be informed by a risk management approach.
- Prevention and early intervention are the most cost-effective techniques for managing weeds.
- Weed management requires coordination among all levels of government, in partnership with industry, land and water managers, and the community, regardless of tenure.
- Building capacity across government, industry, land and water managers, and the community is fundamental to effective weed management.

The WoNS initiative establishes national priorities and facilitates action where there is a significant national or cross-jurisdictional benefit to be gained. These strategic plans do not specifically address resourcing; however, they aim to identify efficiencies and ensure existing resources can be allocated to achieve the most strategic management outcomes.

Effective broadscale management of WoNS and other weeds requires an integrated approach that includes prevention and eradication programs, establishment and implementation of management

zones, and the protection of key environmental, social and economic assets in areas where the weeds are already widespread (Figure 4).



Source: Modified from Hobbs & Humphries (1995) and DPI (2010).

Figure 4 Stages of weed invasion with corresponding goals, management objectives and actions at each stage. For further explanation of how the different management approaches apply to this strategic plan, see the glossary.

2.7.1 Achievements to date

The first Blackberry Strategic Plan was published in 2001, with the vision that ‘blackberry is managed effectively to prevent spread and reduce impact on all land across Australia’. A national coordinator was appointed, and a national taskforce was established in 2003 to implement the strategic plan.

In 2009, the Natural Resource Management Ministerial Council (Resolution 15.7, 21 May 2009) endorsed a three-phased approach to national management of WoNS species (Appendix 2). In 2009, the Australian Weeds Committee reviewed the national strategic plan (Askey-Doran & Wilson 2009), to assess progress towards the plan’s goals and objectives, and to identify areas still requiring implementation and resourcing (under a revised strategy). A summary of the achievements and outcomes of the strategic plan is provided in Tables 3–5.

Table 3 Key achievements and outcomes for goal 1—Prevent, contain and rehabilitate blackberry infestations

-
- There is now a good understanding of both the current and potential distribution of *Rubus fruticosus* agg., and it has been confirmed that blackberry will remain as a widespread significant weed problem. Climate change modelling of potential blackberry distribution for 2030 and 2070 has been completed (Steel et al. 2008).
 - The strategic management of isolated and outlier infestations in Queensland, Tasmania, South Australia and Western Australia has prevented blackberry migrating into clean areas and has protected agricultural and environmental assets. Treatment of core infestations in the Australian Capital Territory, New South Wales and Victoria is helping to protect assets and prevent further blackberry problems occurring.
 - Some initial work has been undertaken to identify economic and social impacts of blackberry. These include an Australian Plantation Survey (Potter 2008), which ranked blackberry as the number one weed problem, and a survey by the Bureau of Rural Sciences of 990 landholders in Tasmania, which ranked blackberry second out of 20 weeds (Askey-Doran & Wilson 2009). Trials in Western Australia have demonstrated a 50% reduction in species diversity. Weed risk assessments in South Australia have identified blackberry as a threat in five natural resource management regions.
 - A decision support system (DSS) has been developed that provides a system for identifying management priorities from the local to national level for blackberry (Poole & Scott 2008). Existing abundance and distribution maps and climate suitability maps were used to inform the development of the DSS.
-

Table 4 Key achievements and outcomes for goal 2—Adoption of ‘best management’ practices nationally

-
- The release of the *Blackberry control manual: management and control options for blackberry in Australia* has increased knowledge and skills of land managers and assisted in the adoption of best-management practices (NSW Department of Primary Industries 2009). A *Blackberry control* brochure has also recently been developed (DPI Victoria 2011) to complement this manual.
 - A high-quality resource on the identification of blackberry species (a Lucid key, which is a web-based identification key) was developed and disseminated (Barker & Barker 2005).
 - Nine training workshops on blackberry identification, biological control and herbicide use have occurred. Workshops have improved the capacity of weed professionals and community members to identify the different blackberry species and determine appropriate controls.
 - A research strategy for blackberry was developed in 2005 and has guided research activities to date. This research strategy is currently being updated to set the future direction for blackberry research.
 - Eight blackberry rust strains have been identified and widely released for biological control. Blackberry rust was approved for release in Tasmania. Monitoring of effectiveness of the rust is continuing. A new program for seeking additional biological control agents has commenced.
 - Various field trials for biological control and herbicides have occurred across the country. For example, the Genoa River Interstate Liaison Committee set up field trials to examine the effectiveness of leaf rust fungus at five sites with moderate–high infestations that had been previously slashed; one site achieved a 98% kill rate.
-

Table 5 Key achievements and outcomes for goal 3—National commitment to the effective management of blackberries is maintained

-
- The National Blackberry Taskforce was established in 2003, with representatives from six states and the ACT, plus community members and a representative from the *Rubus* industry (Australian Rubus Growers Association). This has enabled effective information exchange and decision making between government, the community and industry.
 - *Rubus fruticosus* agg. is declared a noxious weed in all states and territories.
 - Commitment to blackberry management from the plantation industry has been improved in three states through an issues paper, 'Blackberry in timber plantations' (Surace 2009). Implementation of the recommendations from this paper will help achieve a coordinated management approach in plantations.
 - Options for expanding a community-led approach for blackberry management have been explored, with the aim of developing a national model that can increase community participation and ownership of the blackberry issue. A preliminary report has been developed that gauges interest in, and opportunity for, developing a 'National blackberry community model' (Reid 2010). This report is based on a review of community programs in Western Australia, Victoria, New South Wales, Tasmania and Queensland.
-

The review found that, overall, the 2001–06 Blackberry Strategic Plan was mostly complete, and that national coordination had significantly helped all stakeholders to work together to focus on the control, research and management of blackberry.

The review recommended that the 2001–06 strategic plan should be revised, and that the level of national coordination could be reduced. The review also identified the following gaps, which have been addressed in this current strategic plan:

- Increase best-practice knowledge and uptake, including through:
 - distributing and promoting the recently published *Blackberry control manual*
 - updating the national communications strategy to reflect uptake of best practice
 - trialling the decision support system for blackberry
 - continuing biological control research for specific species.
- Increase the understanding of *Rubus* species, including through:
 - continuing training on species identification (with links to control and rehabilitation techniques)
 - finer scale jurisdictional mapping, with a focus on high-priority sites and natural values.

2.7.2 Process followed

The National Blackberry Taskforce (NBT) developed the first draft of this plan, in conjunction with relevant stakeholders, using annual progress reports from the 2001–06 strategic plan, together with recommendations and identified gaps in blackberry management from a review conducted by the Australian Weeds Committee in August 2009 (Askey-Doran & Wilson 2009). A generic program logic that was developed for all WoNS species was applied to blackberry (Appendix 3) and formed the basis for the goals in this strategic plan. In recent years, the NBT has adopted the biosecurity approach of prevention, eradication, containment and asset protection, and has worked with stakeholders to determine national priority areas for blackberry control—this information also informed the draft plan.

The draft of this plan was placed on public display for 30 days in May 2011, and feedback was sought (using a feedback form) from a national network of blackberry managers. All submissions received were considered by the NBT at a teleconference in June 2011, before a final version was

completed and checked with relevant stakeholders. The final version was then presented to state, territory and the Australian governments for approval.

2.8 Relevance to other strategies

The 2012–17 Blackberry Strategic Plan provides a framework to maintain strategic and coordinated management of blackberry across the country. This plan is linked to many national, state, regional and local plans (Table 6) that have been developed to protect biodiversity and agriculture from the threat of weeds.

Table 6 Strategies and plans for the management of blackberry

Scale	Strategies and plans	Policy and legislation
National	Australian Weeds Strategy, Australia's Biodiversity Conservation Strategy (draft), WoNS strategic plans	<i>Environment Protection and Biodiversity Conservation Act 1999, Quarantine Act 1908</i>
State/territory	State and territory biodiversity conservation, invasive species and biosecurity strategies	State and territory pest plant and biodiversity conservation policies, and associated legislation
Regional	Natural resource and catchment management plans, invasive species plans	Guided by state, territory and national legislation and policies
Local	Weed control plans, property management plans, local government weed strategies and plans	Guided by state, territory and national legislation and policies

WoNS = Weed of National Significance

3 Strategic goals

The 2012–17 Blackberry Strategic Plan outlines three five-year goals, which set the future direction and address the challenges for blackberry management. It also outlines the objectives and strategic actions that are required to achieve these goals. The plan aims to build on the achievements from the 2001–06 Blackberry Strategic Plan (ARMCANZ et al. 2000) and, at a minimum, maintain the momentum gained through national coordination to date. It focuses on holistic management of weedy blackberries and therefore recognises blackberry groups outside the *R. fruticosus* aggregate—this is a new direction for the strategic plan.

Blackberry infestations in Australia occur across the invasion spectrum, from new and emerging through to established and widespread (Figure 4). Therefore different areas will require different management approaches. The objectives and strategic actions of goals 1 and 2 set the direction for where these different management approaches are required. Goal 1 establishes where prevention or eradication is still achievable for blackberry in Australia—that is, areas where blackberry is absent or there are a small number of localised populations. Goal 2 distinguishes between areas where containment and asset protection approaches may be appropriate. Containment can still be achieved in areas where blackberry has not yet reached its full distribution limit (e.g. Queensland, Western Australia and parts of South Australia) and can be prevented from spreading further or, in some cases, can have its distribution reduced. For large parts of Australia (Victoria, New South Wales, the Australian Capital Territory, and parts of Tasmania and South Australia), blackberry has mostly reached its distribution limit, and these areas should be managed to protect assets. Goal 3 aims to build and maintain capability and commitment for effective management of blackberry.

3.1 A new direction

The 2001–06 Blackberry Strategic Plan (ARMCANZ et al. 2000) dealt with the *R. fruticosus* aggregate (European blackberry). It has now been recognised that other species of the *Rubus* genus (of North American or Asian origin) are also of concern to land managers in Australia.

Even though these species (outside the *R. fruticosus* aggregate) are not technically considered as a WoNS, the objectives and actions of the 2012–17 Blackberry Strategic Plan recognise these species for the purpose of integrated and holistic management, and to support continuation of efforts where these additional species are already problematic.

In addition, since there are native and commercially grown *Rubus* species in Australia, knowledge of all species (and their identification) is important.

3.2 Goals and objectives

The goals and objectives of the strategic plan are shown in Table 7.

Table 7 Goals and objectives of the Blackberry Strategic Plan 2012–17

Goals	Objectives
1 Prevent new infestations from establishing	1.1 Develop and maintain early detection capabilities 1.2 Prevent establishment of uncommon taxa 1.3 Eradicate outlier infestations 1.4 Use national and state/territory legislation to achieve strategy goals
2 Strategically manage existing infestations	2.1 Contain (or reduce) infestations in areas where full distribution limits have not been reached 2.2 Control core infestations to reduce the impact of blackberry on priority assets
3 Increase the capability and commitment to effectively manage blackberry	3.1 Increase community involvement in blackberry management 3.2 Refine and improve best-practice control options 3.3 Increase uptake of best practice 3.4 Maintain commitment to implementation of the national strategy

Note: For further explanation of the terms used in these goals and objectives, see the glossary.

3.3 Responsible partners and resourcing

Australian, state and territory agencies, regional natural resource management (NRM) bodies, local government, non-government organisations, industry, research organisations and community members all share responsibility for implementing strategic actions of the National Blackberry Strategic Plan. In the past, strategic actions have been delivered through partnerships, and coordinated and consistent approaches to management, with assistance from a national coordinator and a national taskforce.

Implementation of the strategic actions in this plan will no longer have the benefit of a national coordinator; therefore, delivery of these actions relies on the good will of all listed partners to continue to build momentum in a coordinated manner. By doing so, previous investment in blackberry management will be protected, and communities that are affected by the impacts of blackberry will be supported. This plan provides a framework for action; all actions can only occur within future funding and resourcing constraints.

3.4 Prioritisation

The strategic actions have been ranked according to their priority for implementation. A key intention and the first priority of this strategic plan is to maintain the momentum to date. The priorities are as follows:

- 1 First priority: actions that must be completed to maintain momentum.
- 2 Second priority: actions that may not be required to maintain momentum, but would build on momentum and/or add significant value.
- 3 Third priority: actions that are not necessarily required to maintain momentum, but would bring benefits to blackberry management.

Rankings were determined by the NBT using feedback provided during the public consultation process.

3.5 Goal 1: Prevent new infestations from establishing

Goal 1 addresses the potential for some less common *Rubus* taxa to spread and identifies where there are outlier infestations of the *R. fruticosus* aggregate that can be eradicated. The strategic actions for each objective under goal 1, and the action level and responsible partners for each action, are shown in Table 8.

Objective 1.2 addresses the potential for establishment and spread of uncommon *Rubus* taxa. These include any species of European, North American or Asian origin that are invasive and are not commonly recorded, so that there may be potential to prevent their establishment or eradicate infestations. However, information on the distribution and management requirements for these species still needs to be collated (see action 1.2.1) to enable informed management decisions about individual taxa or areas for control. Current information on the distribution of all *Rubus* in Australia can be found in Appendix 1. Objective 1.3 addresses areas where blackberry outliers (mainly *R. fruticosus* agg.) are known to exist and eradication can be achieved.

Education and training in identification of the different species and groups are important to enable early detection and reporting of uncommon species. It would be beneficial to conduct these activities in conjunction with other weed and land management activities. Action 1.1.1 highlights this need; further details on these activities are provided under goal 3.

Table 8 Objectives and strategic actions to achieve goal 1 of the Blackberry Strategic Plan 2012–17

Objective	Strategic action	Action level ^a	Responsibility
1.1 Develop and maintain early detection capabilities	1.1.1 Conduct awareness activities (as per actions 3.3.1 and 3.3.2)	2	State/territory and local governments, NRM regions
	1.1.2 States and territories supply data to a nationally coordinated system	1	Australian and state/territory governments
	1.1.3 Report and record new infestations and taxa using national mapping standards (McNaught et al. 2005); contribute data to national dataset (and, when available, nationally coordinated system)	2	All land managers
	1.1.4 Conduct periodic review of potential distribution modelling	3	State/territory governments
1.2 Prevent establishment of uncommon taxa	1.2.1 Collate distribution information and determine management requirements (and sites) for uncommon taxa	2 ^a	State/territory governments (with local governments, NRM regions, industry)
	1.2.2 Develop and implement programs to eradicate uncommon taxa, as identified in strategic action 1.2.1. Where eradication is not feasible, refer to objectives 2.1 or 2.2 and their actions	3 ^a	All land managers

Objective	Strategic action	Action level ^a	Responsibility
1.3 Eradicate outlier infestations	1.3.1 Complete eradication programs in the following regions: <ul style="list-style-type: none"> • Kangaroo Island, South Australia • Flinders, King, Maatsuyker and Tasman islands, Tasmania • South West World Heritage Area, Tasmania • blackberry-free buffer zone in south-west Western Australia • Esperance, Western Australia 	2	South Australia, Tasmania, Western Australia state governments (with local governments, NRM regions, industry and community)
	1.3.2 Develop and implement programs to eradicate any new incursions or newly reported outliers. Where eradication is not feasible, refer to objectives 2.1 or 2.2 and their actions	2	State/territory governments (with local governments, NRM regions, industry and community)
1.4 Use national and state/territory legislation to achieve strategy goals	1.4.1 Minimise the introduction of <i>Rubus</i> taxa that pose a high risk of establishing and spreading	1	Australian Government (AQIS)
	1.4.2 Maintain noxious weed declaration (prohibit sale and movement as a minimum) of <i>R. fruticosus</i> taxa in all states and territories	1	State/territory governments
	1.4.3 Consider declaration of invasive North American and Asian <i>Rubus</i> taxa, and exemptions for commercial <i>Rubus</i> taxa	2	State/territory governments, industry
	1.4.4 Explore opportunities (including enforcement) to use legislation and policy to support strategy objectives	2	State/territory governments (with relevant weed control authority)

AQIS = Australian Quarantine and Inspection Service; NRM = natural resource management

a The Australian Weeds Committee (AWC) applied three action levels that reflect jurisdictional commitment to implementing actions: Level 1 = Highly beneficial as a national action that is critical to success of the WoNS revised strategic plan and all relevant AWC jurisdictions have committed resources to implementing this action.

OR

Highly beneficial to a particular jurisdiction and the responsible party/ies have committed resources to implement this action.

Level 2 = Highly beneficial at national and/or jurisdictional level, but implementation will be subject to resource availability and investment priorities.

Level 3 = Desirable and still beneficial to improving uptake and efficiency of on-ground action, but not critical to success.

Notes:

1. See glossary for explanation of uncommon taxa, eradication, outlier infestation, new incursion and weed control authority.
2. Actions 1.2.1 and 1.2.2, although a high priority in the biosecurity sense, are considered a level 2 priority in this strategic plan because they are new actions, rather than actions that will be required to maintain existing momentum (priority level 1). These actions would add significant value to blackberry management should they be carried out.

3.6 Goal 2: Strategically manage existing infestations

In many areas of Australia, the common species of European blackberry—*R. anglocandicans* and *R. ulmifolius*—have reached their distribution limit. Goal 2 involves a strategic approach for management of these infestations. It distinguishes between the areas where blackberry has not yet fully reached its limit and can be contained or even reduced (objective 2.1), and the areas where blackberry has already reached its distribution limit, but could expand in density within this area and should be managed to protect assets (objective 2.2).

The strategic actions for each objective under goal 2, and the action level and responsible partners for each action, are shown in Table 9.

Removing (or, where feasible, eradicating) satellite infestations of blackberry, or reducing its local distribution, may be achievable for some regions listed under action 2.1.1. This should be the first

priority for areas where it is achievable. Where it is not achievable, containment should focus on managing the current infestations to prevent spread into new areas.

Other strategic actions for this goal will support decision making and improve management outcomes. Successful implementation of the strategic actions will depend on the availability of funding.

Table 9 Objectives and strategic actions to achieve goal 2 of the Blackberry Strategic Plan 2012–17

Objective	Strategic action	Action level ^a	Responsibility
2.1 Contain (or reduce) infestations in areas where full distribution limits have not been reached	2.1.1 Continue to contain (and, where possible, remove) satellite infestations of blackberry or reduce it where it has not reached its full distribution limits, including in: <ul style="list-style-type: none"> • south-east South Australia • Clare Valley, South Australia • south-east Queensland • areas south of the blackberry-free buffer zone of Western Australia (includes <i>R. laudatus</i> and other invasive blackberry species) • south coast region, Western Australia (Denmark/Albany, Porongurup, Walpole) 	2	State/territory governments (with NRM regions, local governments, NGOs and community)
	2.1.2 Identify if/where additional containment programs can commence (e.g. Helena River catchment, Western Australia). Develop and implement management plans (including surveillance and mapping) for these areas	3	State/territory governments (with NRM regions, local governments, NGOs and community)
	2.1.3 Map blackberry to national mapping standards (McNaught et al. 2005) and contribute data to national dataset	2	All land managers
2.2 Control core infestations to reduce the impact of blackberry on priority assets	2.2.1 Compile database of key national, state and regional ecological assets threatened or impacted by blackberry and other WoNS, and develop management actions and strategies to protect assets	2	State/territory governments, NRM regions
	2.2.2 Map blackberry to national mapping standards (McNaught et al. 2005) and against identified assets; contribute data to national dataset (and, when available, national mapping tool)	2	All land managers
	2.2.3 Develop and implement management plans to control blackberry in accordance with priority assets identified under strategic actions 2.2.1 and 2.2.2 (e.g. ACT Parks and Conservation Service 2011)	2	All land managers
	2.2.4 Trial the decision support system (Poole & Scott 2008) for blackberry and, where successful, encourage its use for planning	3	State/territory and local governments, NRM regions

NGO = non-government organisation; NRM = natural resource management; WoNS = Weeds of National Significance

^a The Australian Weeds Committee (AWC) applied three action levels that reflect jurisdictional commitment to implementing actions: Level 1 = Highly beneficial as a national action that is critical to success of the WoNS revised strategic plan and all relevant AWC jurisdictions have committed resources to implementing this action.

OR

Highly beneficial to a particular jurisdiction and the responsible party/ies have committed resources to implement this action.

Level 2 = Highly beneficial at national and/or jurisdictional level, but implementation will be subject to resource availability and investment priorities.

Level 3 = Desirable and still beneficial to improving uptake and efficiency of on-ground action, but not critical to success.

Note: See glossary for explanation of containment/contain, reduction/reduce, removal/remove, satellite infestation, core infestation.

3.7 Goal 3: Increase the capability and commitment to effectively manage blackberry

Blackberry is a long-term management problem; it cannot be managed with a one-off effort. Successful blackberry management relies on much persistence and commitment. The first two goals of the strategic plan set out approaches for blackberry management in different areas of Australia; goal 3 aims to build foundations to ensure that these approaches can be implemented. It aims to build and maintain a commitment to the long-term management of blackberry and ensure that land managers are equipped with the best possible knowledge, tools and methods. It will be particularly important to educate land managers on the different blackberry species and their identification to achieve the objectives under goal 1.

Goal 3 also ensures that the critical role of the community in blackberry management is recognised—the best way to achieve long-term success in local blackberry management is through programs that are driven by the community and partnerships. Again, successful implementation of all strategic actions will depend on the availability of funding.

The strategic actions for each objective under goal 3, and the action level and responsible partners for each action, are shown in Table 10.

Table 10 Objectives and strategic actions to achieve goal 3 of the Blackberry Strategic Plan 2012–17

Objective	Strategic action	Action level ^a	Responsibility
3.1 Increase community involvement in blackberry management	3.1.1 Encourage adoption of community-led approaches for local blackberry management (use successful models, e.g. Victoria, Queensland, Western Australia)	2	State/territory and local governments, NRM regions, Landcare
	3.1.2 Assist the community to manage blackberry strategically and cooperatively	2	
3.2 Refine and improve best-practice control options	3.2.1 Review the biological control of blackberry (and implement review recommendations and actions)	2	State/territory governments (with research organisations and land managers)
	3.2.2 Identify and prioritise future research needs; review and update research strategy	2	Research organisations, state/territory governments
	3.2.3 Develop and maintain partnerships with research organisations and promote research needs (including to investors)	2	Australian and state/territory governments
	3.2.4 Address priority research needs (as identified in research strategy)	3	Research organisations (with oversight from Australian Government, state/territory governments, NBT)

Objective	Strategic action	Action level ^a	Responsibility
3.3 Increase uptake of best practice	3.3.1 Support education and awareness activities (particularly in areas that will support implementation of goal 1), including training land managers in blackberry identification (to differentiate between European, North American, Asian and native species)	1	State/territory and local governments, NRM regions, Landcare
	3.3.2 Distribute blackberry extension resources, including identification tools and the <i>Blackberry control manual</i> ^b	1	State/territory and local governments, NRM regions, Landcare
	3.3.3 Promote and disseminate new knowledge obtained through research (including updating management resources)	2	Australian and state/territory governments, NBT, research organisations
	3.3.4 Improve long-term site management post-treatment (especially follow-up control and replacing blackberry with appropriate species)	3	All land managers
3.4 Maintain commitment to implementation of the national strategy	3.4.3 Encourage blackberry management networks for communicating relevant information (in line with objective 3.3 and communications plan)	2	State/territory governments
	3.4.4 Support partnerships and manage blackberry cooperatively	2	All land managers
	3.4.5 Monitor and review progress towards strategic plan goals against the monitoring, evaluation, reporting and improvement plan (see Table 11)	2	Australian Weeds Committee (with input from state/territory and local governments, NRM regions, industry, NGOs, Landcare)

NBT = National Blackberry Taskforce; NGO = non-government organisation; NRM = natural resource management

a The Australian Weeds Committee (AWC) applied three action levels that reflect jurisdictional commitment to implementing actions:
Level 1 = Highly beneficial as a national action that is critical to success of the WoNS revised strategic plan and all relevant AWC jurisdictions have committed resources to implementing this action.

OR

Highly beneficial to a particular jurisdiction and the responsible party/ies have committed resources to implement this action.

Level 2 = Highly beneficial at national and/or jurisdictional level, but implementation will be subject to resource availability and investment priorities.

Level 3 = Desirable and still beneficial to improving uptake and efficiency of on-ground action, but not critical to success.

b NSW Department of Primary Industries (2009).

4 Monitoring, evaluation, reporting and improvement framework

The Australian Weeds Strategy (NRMMC 2007) gives the Australian Weeds Committee (AWC) responsibility for monitoring and evaluating the management of national priority weeds, including WoNS. The AWC is therefore responsible for monitoring and reporting on progress under this strategic plan.

This strategic plan is subject to a five-year review; however, mechanisms must also be put in place to allow the goals and actions to be evaluated throughout this period. This enables ongoing assessment of progress towards intermediate and long-term outcomes, and, ultimately, helps to determine the effectiveness of individual actions. It also helps to identify program improvements, and provides evidence to stakeholders and funding bodies that they are getting value from their investment.

Individual jurisdictions and/or organisations responsible for weed management and conservation will need to develop their own monitoring strategies. They should, where possible, coordinate actions to implement this plan, and monitor and evaluate progress towards its goals in conjunction with existing state, regional or local plans. While individual actions should be monitored at the jurisdictional level, data or evidence collected as a part of state, regional and local activities or plans should be provided to the AWC and collated so that it can be assessed each year within the national context. This will help to build a comprehensive overview of the plan's delivery. Table 11 lists key evaluation questions that must be assessed by the AWC each year at the national level to ensure progress against strategy goals, and which should be used to provide the basis for an annual report to the AWC.

This monitoring, evaluation, reporting and improvement (MERI) framework lists the basic reporting information that should be collected for the life of the strategic plan—including during phase 3 delivery (see Appendix 2). This will ensure that sufficient data are collected to identify successes and failures, and provide the opportunity for improvement where outcomes are not being achieved. Annual MERI plans may be developed to follow activities in more detail.

Although performance indicators or other ways of measuring progress are not provided in this strategic plan, a scoring system could be appropriate.

A generic program logic model (Appendix 3) was developed by WoNS coordinators in 2010. This shows the relationship between strategic actions and the objectives and goals they achieve. The program logic is one way to communicate the links between activities, their intermediate and long-term outcomes, and the vision of the strategic plan.

Table 11 Suggested monitoring and evaluation questions to measure progress under the phase 3 Blackberry Strategic Plan 2012–17

WoNS:		Jurisdiction:	Date:
Goal	Key evaluation questions	Data or evidence required	Consider
1 Prevent new infestations from establishing	To what extent have new infestations been prevented from establishing?	1.1 National distribution data: Has the national distribution map been reviewed and/or updated? Has the Priority Management Action spreadsheet been updated?	<ul style="list-style-type: none"> • Are these documents publicly available? • Have stakeholders been advised of any changes? • Where is this data or information stored? • Does this information capture national priorities?
		1.2 New infestations: Number of new infestations recorded Percentage of known infestations actively controlled	<ul style="list-style-type: none"> • Are any new infestations occurring in areas identified as a high priority in the national strategy? • How were infestations detected (passive or active surveillance, community reporting etc.)? • Have high-risk pathways been adequately identified? • Have threats been minimised?
		1.3 Eradication and containment programs: Percentage of eradication and/or containment programs being maintained	<ul style="list-style-type: none"> • What percentage of programs identified in the national strategy are being actively managed? • Is there a plan in place for ongoing management? • How is progress being monitored and reported to stakeholders? <p>(Examples using case studies can be included)</p>
		1.4 Legislation: Legislation or policy changes for this species Legislative change has been identified by stakeholders	<ul style="list-style-type: none"> • What legislative changes have been made? • Are minimum requirements being maintained (e.g. ban on sale, trade, movement)? • Is control required throughout or in part of the jurisdiction? • Is compliance actively enforced?
			Score:

Table 11 *continued*

WoNS:		Jurisdiction:		Date:
Goal	Key evaluation questions	Data or evidence required	Consider	
2	Strategically manage existing infestations	2.1 Integrated weed management: Effectiveness of integrated weed management programs	<ul style="list-style-type: none"> Are existing tools providing adequate control of WoNS? Have new advances or technologies been developed and are they incorporated into best-practice management information? Are there barriers to adoption of best-practice management? Are research programs addressing any observed gaps (e.g. herbicide trials, biocontrol, restoration requirements post-control)? 	
		2.2 Asset protection: Number of priority assets identified as 'at risk' from WoNS Percentage of priority assets being protected (e.g. assessed against relevant threat abatement plans) Percentage of state and regional invasive species plans that identify priority assets at risk from WoNS	<ul style="list-style-type: none"> Methods by which assets are being protected (e.g. targeted annual spray programs, high-risk pathway surveillance, strategic plans) Are long-term monitoring programs in place to detect change? To what extent is management leading to an improvement in asset condition? <p>(Response should include status report on progress towards asset-protection programs)</p>	
			Score:	
3	Increase capability and commitment to manage WoNS	3.1 Community engagement and awareness: What is the status of best-practice information? Are partnerships being maintained to ensure collaboration on WoNS? Number and type of media activities	<ul style="list-style-type: none"> Is best-practice information up to date and readily available? Is this information and/or advice being targeted to priority regions? Is training being delivered to meet the needs of weed managers (including the community)? Are networks and groups being supported (e.g. through dissemination of research outcomes, funding opportunities, control options etc.)? Has awareness and engagement in WoNS management been raised effectively? 	

Table 11 *continued*

WoNS:		Jurisdiction:	Date:
Goal	Key evaluation questions	Data or evidence required	Consider
		<p>3.2 Resourcing: From what sources are programs being funded?</p> <hr/> <p>3.3 Policy and planning: Are the objectives of the strategy being integrated into Australian Government/state/regional plans, policies and programs? Has cross-border collaboration occurred?</p>	<ul style="list-style-type: none"> Number of projects funded by Australian Government, jurisdictions, industry, etc. How are priorities reflected in planning and policy approaches (e.g. weed risk assessments, invasive species plans, asset-protection plans, district plans, weed spread prevention activities, management programs, incentive programs, state working groups)? How are national priorities being maintained (e.g. containment lines, eradication targets, training and awareness raising, research projects)?
			Score:
Continuous improvement	Are there any unexpected outcomes that have been identified through implementation of strategy?	<p>Barriers:</p> <ul style="list-style-type: none"> Have any other management issues or impediments been identified? 	

WoNS = Weeds of National Significance

Scoring

1: Insufficient evidence to score

2: No progress has been made against this goal

3: Limited progress is being made against this goal

4: Reasonable progress is being made against this goal

5: Excellent progress is being made against this goal

5 Stakeholder responsibilities

Although landowners and managers have primary responsibility for the control of blackberry on their land, agencies and individuals both share responsibilities for the actions listed in Sections 3 and 4. The effective implementation of this strategy requires the involvement of a range of stakeholders. Stakeholders' responsibilities may vary between jurisdictions: some actions may be optional while others are prescribed by legislation. The successful achievement of strategic actions relies on the development and maintenance of partnerships between community, industry and government, and recognition of the roles of each stakeholder. In particular, while the National Blackberry Taskforce provided oversight for the original strategy, future coordination arrangements will evolve to maintain and build on past achievements. The Australian Weeds Committee, at a national level, and various agencies at the state and territory level will continue to provide a leadership role.

Appendix 1 Distribution and origin of *Rubus* species recorded in Australia

These tables are excerpts from the *Blackberry control manual* (NSW Department of Primary Industries 2009). Tables A1, A2 and A3 show the distribution and origin of European blackberry (*R. fruticosus* agg.), native *Rubus* species and other introduced *Rubus* species in Australia, respectively.

Table A1 Distribution and origin of European blackberry in Australia, 2007

SPECIES	DISTRIBUTION AND ORIGIN
<i>R. anglocandicans</i>	Most commonly recorded species in southern Australia. It occurs in the wetter areas of all the southern States and south-eastern Qld.
<i>R. leucostachys</i>	Widespread distribution. Recorded in NSW, Vic., Tas. and SA. Widespread in Vic. Recorded in Kosciusko National Park, NSW.
<i>R. polyanthemus</i>	Widespread in Vic. Recorded in Kosciusko National Park, NSW.
<i>R. laciniatus</i>	Recorded in the wetter areas of NSW and SA. Also recorded on the central-west coast of Tas.
<i>R. ulmifolius</i> var. <i>ulmifolius</i>	Recorded in all southern States of Australia,
<i>R. ulmifolius</i> var. <i>anoplothyrus</i>	Recorded in SA and WA. Possibly present in other States. No prickles on primocanes
<i>R. vestitus</i>	Recorded in NSW, SA and Tas. but not common.
<i>R. leightonii</i>	Recorded only in NSW.
<i>R. erythrops</i>	Recorded in Vic., Tas. and SA.
<i>R. cissburiensis</i>	Recorded only in Vic.
<i>R. echinatus</i>	Mostly recorded in north-eastern Tas. Also recorded in Vic. and Flinders Island.
<i>R. rubritinctus</i>	Recorded in the Mt Lofty Ranges of SA and Geeveston and Pipers Brook in Tas.
<i>R. phaeocarpus</i>	Limited distribution. Recorded in the Mt Lofty Ranges in SA and in the Kowmung River area of NSW.
<i>R. riddelsdellii</i>	Recorded only in the Mt Lofty Ranges of SA.
<i>R. sp. Tasmania</i> (J.R. Hosking 1551)	Confined to Tas., predominantly in the north western region.
<i>R. sp. Scott Creek</i> (D.E. Symon 16054)	Recorded only in the Mt Lofty Ranges of SA.

Table A2 **Distribution and origin of native *Rubus* species in Australia, 2007**

SPECIES	DISTRIBUTION AND ORIGIN
<i>R. moluccanus</i> var. <i>Moluccanus</i>	Found along the east coast of Australia from the Mcilwraith Range to the Moreton Bay district.
<i>R. moluccanus</i> var. <i>trilobus</i>	Found along the east coast of Australia from the Atherton Tableland to northeastern Vic. More commonly encountered than <i>R. moluccanus</i> var. <i>moluccanus</i>
<i>R. nebulosus</i>	An east coast species extending from the NSW-Qld border to Batemans Bay on the South Coast of NSW Flowers from August to January and is found in rainforests or tall eucalyptus forests next to rainforests.
<i>R. parvifolius</i> (native raspberry)	The most widely distributed native species of <i>Rubus</i> In Australia. Extends from central Qld, along the east coast to Vic. and Tas. along the coastline to the Mt Lofty Ranges in S.A. Often occurs with the <i>R fruticosus</i> agg.
<i>R. gunnianus</i> Hook. (alpine Tasmania)	A Tasmanian endemic species that occurs in alpine vegetation. It is very small and easily distinguishable from introduced <i>Rubus</i> species.
<i>R. moorei</i> (silky bramble)	Generally confined in distribution from Lismore in NSW to the Conondale Ranges in Qld.
<i>R. rosifolius</i>	Found along the eastern coast of Australia, from south-eastern Qld through to Vic.
<i>R. queenslandicus</i>	An endemic north Qld species from the Atherton Tableland region.
<i>R. probus</i>	A species confined to coastal areas of Qld between Daintree and Brisbane.
<i>R. x novus</i>	An apparently sterile hybrid between <i>R. moluccanus</i> var. <i>trilobus</i> and <i>R. parvifolius</i> . This hybrid occurs naturally and is found along the east coast of Australia where both species occur.

Table A3 Distribution and origin of other *Rubus* species in Australia, 2007

SPECIES	DISTRIBUTION AND ORIGIN
<i>R. laudatas</i> (Bundy/Plains blackberry)	Commonly recorded as a weed in south-west WA, south-eastern Qld and throughout the Sydney area of NSW. Originating from North America.
<i>R. philadelphicus</i> (lawtonberry)	Recorded as a weed in Pipers Creek area of northern Tas- and in Cooma in south-eastern NSA. Originating from North America.
<i>R. loganobaccus</i> (loganberry)	Recorded as a weed in south-western WA across the mid-north region of SA, on Kangaroo island, in the Canberra region, in the Ballarat area of Vic- and in southern-eastern Tas. A hybrid between North American <i>R. ursine</i> and Eurasian <i>R. idaeus</i> . Can be distinguished by its pinnate leaves and its oblong fruit, which is dark red to dull black.
<i>R. ellipticus</i> (yellow Himalayan raspberry)	Recorded as a noxious weed in south-eastern Old. Also found in the north-eastern and Blue Mountains regions of NSW. Originating from Asia. Easily distinguished by its yellow to orange fruit.
<i>R. idaeus</i> (raspberry)	Cultivated in the cooler region of the southern States. Originating from Eurasia; sometimes also considered to be native to North America- Naturalised populations recorded in NSW, Vic. and SA. Not considered to be aggressively weedy- has red fruit.
<i>R. rugosus</i> (keriberry)	Grown in NSW and Qld for its fruit- Originating from Asia- Naturalised populations recorded in the Comboyne area of NSA and the Belgrave South area of Vic. At this time it is not aggressively weedy. Also recorded in small numbers in WA and Tas.
<i>R. roribaccus</i> (dewberry, youngberry and boysenberry)	Naturalised populations recorded in the Central Coast and Sydney regions of NSW. Also recorded in the Portland region of western Vic. Originating from Northern America. At this stage it is not aggressively weedy.
<i>R. alceifolius</i>	Recorded in the Cape Tribulation region of Old. Originating from Asia and a weed in many parts of the world.
<i>R. odoratus</i>	Often cultivated for its large, scented, pink-purple rose-like flowers. Not recorded with any confidence as naturalised in Australia, despite the possible record from Hobart in Tas.
<i>R. niveus</i>	Only recently (2008) recorded as naturalised in Australia; found in Qld and the on the North Coast of NSW. Originating from Asia, and considered a weed in other parts of the world. Also grown for its sweet fruit. Flowers are pink to rose purple.

Appendix 2 The Weeds of National Significance initiative and its phases²

In 2007, an independent review of the WoNS initiative concluded that the nationally strategic approach of WoNS was highly successful in leveraging consistent multijurisdictional activity on high-priority weed species. This initial review was followed by a detailed review of the inaugural WoNS species by the Australian Weeds Committee (AWC) in 2009–10. The AWC reviewed the implementation of the 20 WoNS national strategies and, in light of achievements for these 20 species, considered the capacity for national coordination of additional WoNS species.

Following the reviews, the Natural Resource Management Ministerial Council (Resolution 15.7, 21 May 2009) endorsed a three-phased approach to national management of WoNS species (Figure 5). This 'phased approach' aims to provide the most cost-effective use of limited 'national coordination' resources.

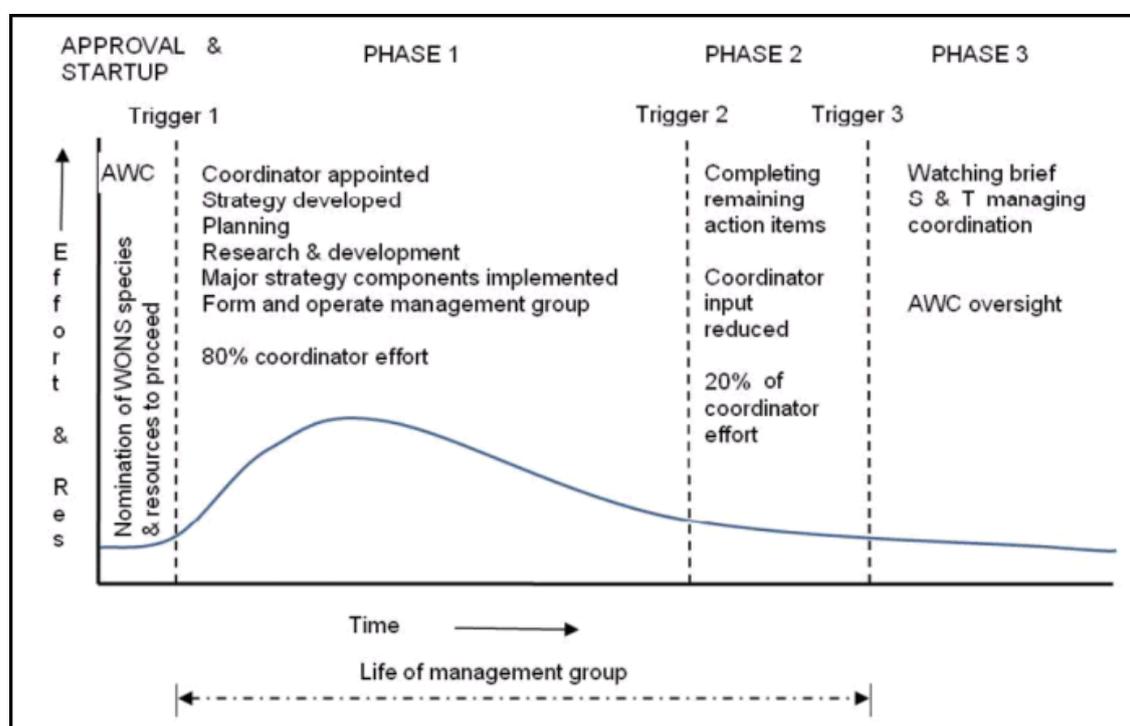


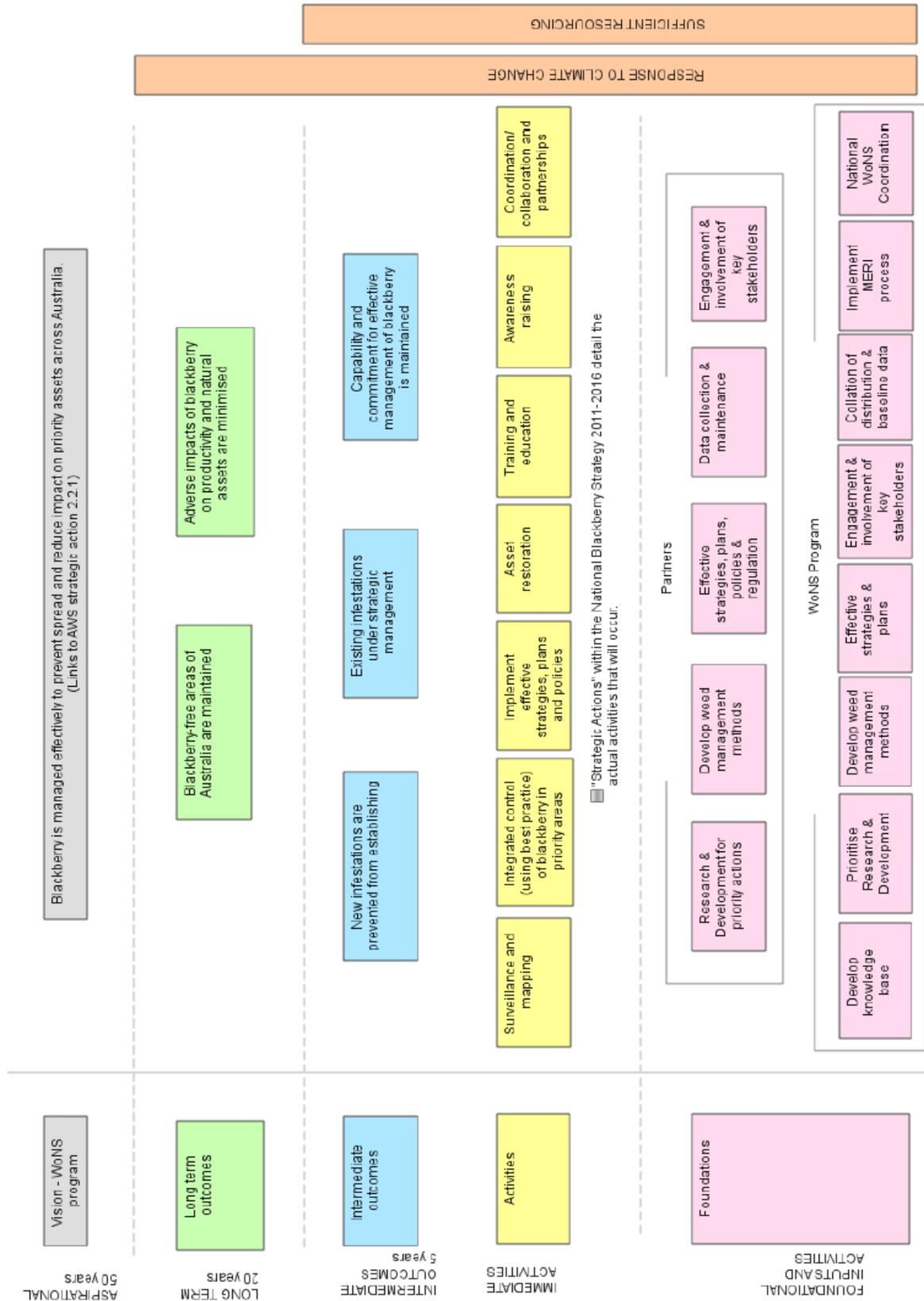
Figure 5 Australian Weed Committee diagrammatic representation of coordinator effort and resource use when implementing a Weeds of National Significance strategy

The phased approach recognises the need for reduced national coordination ('phasing down') of WoNS species that are under effective national management, and allows for further weed species to be nominated for consideration as additional WoNS. The AWC is implementing these reforms, and national coordination of the inaugural 20 WoNS species has already transitioned to phase 2 or 3, depending on the species. No species have yet been removed from the WoNS list. The AWC is developing a protocol to guide future decisions about when this should occur on a case-by-case basis.

²

Adapted from Thorp 2012, *Additional list of Weeds of National Significance*, <www.org.au/WoNS>.

Appendix 3 Program logic model for the blackberry strategic plan



Glossary

The following terms that are used in this strategic plan are defined within the national context.

Infestation type

Core infestation: Established populations of blackberry that are widespread and have mostly reached their distribution limits but may expand in density within this limit. Satellite infestations may arise from these infestations.

New incursion: An isolated population of blackberry that has recently been detected and is not known to be established within the area (but could become established if control does not occur).

Outlier infestation: Populations of blackberry that are outside the core distribution and where eradication can be achieved.

Satellite infestation: An infestation that has spread from an established population of blackberry and could be eradicated (see also 'core infestation').

Management approach

Asset: A natural resource that is considered to be of environmental, agricultural (production) or social benefit.

Asset protection: Control of blackberry within core infestations according to where priority assets occur (blackberry is controlled in and around the most important assets first). Eradication of satellite infestations or containment may also be appropriate at the regional or local level to protect assets.

Containment/contain: Control of blackberry on the outer edges of core infestations to prevent an increase in distribution (see also 'reduction' and 'removal').

Eradication: Continual control of outlier infestations of blackberry that, over the long term, will lead to blackberry no longer being present within that area.

Reduction/reduce: Control of blackberry on the outer edges of a core infestation to reduce the extent of the overall distribution within that area.

Removal/remove: Control of isolated and satellite infestations to contain further spread (leading to eradication in some instances).

Other terms

Control: Use of integrated management tools and techniques (including physical, chemical or biological, in accordance with best practice) to prevent, reduce or remove blackberry infestations.

Uncommon taxa: *Rubus* species of European, North American or Asian origin that are invasive and are not commonly recorded (and pose a threat to our assets). Where found, these would most likely be considered as either outlier infestations or new incursions. See Appendix 1 for a list of the *Rubus* taxa in Australia and their known distributions.

Weed control authority: The agency (or authority) with power to enforce the relevant weed legislation within each state or territory.

References

- ACT Parks and Conservation Service 2011, *ACT environmental weed control operations plan 2011–2019*, <www.actnrmcouncil.org.au/files/Updated_10_19_WOP.pdf>.
- ARMCANZ (Agriculture and Resource Management Council of Australia and New Zealand), Australian and New Zealand Environment and Conservation Council, and forestry ministers 2000, *Weeds of National Significance—blackberry (Rubus fruticosus L. agg.) strategic plan*, National Weeds Strategy Executive Committee, Launceston.
- Askey-Doran, M & Wilson, B 2009, *Review of the implementation of the Blackberry Strategic Plan (2001–2006)*, Australian Weeds Committee (internal report).
- Barker, R & Barker, B 2005, *Blackberry: an identification tool to introduced and native Rubus in Australia*, CD-ROM, State Herbarium of South Australia, Adelaide.
- Bruzzese, E & Lane, M 1996, *The blackberry management handbook*, Department of Conservation and Natural Resources, CRC for Weed Management, Victoria.
- DPI (Victorian Department of Primary Industries) 2010, *Invasive plants and animals policy framework*, State Government of Victoria, Melbourne.
- DPI Victoria (Victorian Department of Primary Industries) 2011, *Blackberry control brochure: management and control options for blackberry (Rubus spp.) in Australia*, Department of Primary Industries, Victoria.
- Evans, KJ, Symon, DE, Whalen, DE, Hosking, MA, Barker, RM & Oliver, JA 2007, 'Systematics of the *Rubus fruticosus* agg. (Rosaceae) and other exotic *Rubus* taxa in Australia', *Australian Systematic Botany*, vol. 20, pp. 187–251.
- Gray, P 2009, *Australian Rubus Growers Association: RB08006 strategic planning facilitation—focus groups, final report*, RMCG (consultants for Australian Rubus Growers Association), Victoria.
- Hobbs, RJ & Humphries, SE 1995, 'An integrated approach to the ecology and management of plant invasions', *Conservation Biology*, vol. 9, pp. 761–770.
- McNaught, I, Thackway, R, Parsons, M & Brown, L 2005, *A field manual for surveying and mapping nationally significant weeds*, Bureau of Rural Sciences, Canberra.
- NLWRA (Australian Government National Land and Water Resources Audit) 2008, *Map of current distribution of blackberry in Australia*, Australian Government, Canberra.
- NRMCC (National Resource Management Ministerial Council) 2007, *Australian Weeds Strategy—a national strategy for weed management in Australia*, Australian Government Department of the Environment and Water Resources, Canberra.
- NSW Department of Primary Industries 2009, *Blackberry control manual: management and control options for blackberry (Rubus spp.) in Australia*, Weed Management Unit, NSW, Victorian Department of Primary Industries, Melbourne.
- Poole, A & Scott, A 2008, *Developing a blackberry Decision Support System for management at a local to national scale*, Department of Primary Industries, Victoria.

- Potter, KJB 2008, *A survey of the Australian forestry sector on the issue of weeds and weed management*, CSIRO Sustainable Ecosystems, Hobart.
- Reid, M 2010, *Options paper for the National Blackberry Taskforce: promoting a community-led approach for blackberry management*, Department of Primary Industries, Victoria.
- Steel, J, Kohout, M & Newell, G 2008, *Climate change and the potential distribution of weeds. Whither the weeds under climate change?*, Department of Primary Industries, Victoria.
- Surace, L 2009, *National Blackberry Taskforce issues paper: blackberry and timber plantations*, Department of Primary Industries, Victoria.
- Weeds CRC 2006, *Economic impact assessment of Australian weed biological control*, Technical Series Report No. 10, Cooperative Research Centre for Australian Weed Management, Adelaide.