WEEDS OF NATIONAL SIGNIFICANCE

BLACKBERRY

(*Rubus fruticosus* L. agg.)

Strategic Plan

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Supporting information about the National 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, their management committees and copies of the strategy.

This strategy was developed under the leadership of the Dept of Natural Resources & Environment with full cooperation of all the States, Territories and Commonwealth of Australia.

Comments and constructive criticism are welcomed as an aid to improving the process and future revisions of this strategy.

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EXECUTIVE SUMMARY

European blackberries (*Rubus fruticosus* L. agg.) ("blackberries") have been designated Weeds of National Significance.

Blackberries are a serious weed throughout temperate Australia, and threaten both agricultural and natural ecosystems. Many Australians believe blackberries are the single, biggest plant threat to southern Australia. They occur in all Australian states and the ACT.

The economic cost of blackberries alone is high. Recent economic costs Australia-wide need to be collated and published. A 1984 survey in Parsons and Cuthbertson, 1992, estimated this to be $42 million annually. This was without factoring in the social and biodiversity costs. In the ensuing years, these annual costs have risen considerably.

The vision of this strategy is:

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

The strategy aims to address three outcomes, listed at right. This document also aims to recognise the good quality research going on throughout Australia. Much of this research is directed at enhancing the management practices already available for controlling blackberries.

The major challenges for blackberry management throughout Australia are; the prevention of spread by vegetative propagation and seed spread, controlling and reducing existing infestations, and rehabilitating treated areas to prevent reinfestation by blackberries or other weeds. The extent to which these aims are achieved, are to be evaluated by a review process with a five-year cycle.

1 Prevent, contain and rehabilitate blackberry infestations.

- The spread of blackberries from infested land to currently uninfested areas is to be minimised.
- Reduce the repeated weed reinfestation of previously "managed" land by effective rehabilitation.
- Assess, and act on the economic, environmental and social impacts of blackberry.

2 Adoption of "best management" practices nationally.

- Implement "best management" practices for blackberry.
- Establish and maintain means of communication between land managers.

3 National commitment to the effective management of blackberries is maintained.

- Blackberry is recognised as an important noxious weed by the states and territories, local governments, and other land managers.
- An on-going national blackberry taskforce is established.
- Recognise the different land managers with responsibilities for blackberry management, and develop cooperative links.
- National blackberry research programs are initiated and coordinated.

The implementation of the national *Blackberry Strategic Plan* will result in minimising the spread and reducing the impact of blackberry infestations across Australia.

*** The terms "blackberry" and "blackberries" are used in this strategy to refer to all taxa within the *Rubus fruticosus* L. aggregate.**

THE CHALLENGE

Identification and scope of problem
Blackberry is a well-known, widespread weed in Australia. Many land managers have already been involved in controlling blackberry. Whilst this effort has been considerable, the blackberry problem has continued to increase and it must be recognised that to successfully constrain the invasion, ongoing adequate and increased funding will be required. Future directions need to be accompanied with clear and concise ways to manage this problem, and realistic expectations as a result of implementing the management options advised.

The challenge is to educate land managers about the impacts of blackberry and the best management practices to control it.

Blackberry is highly invasive
Blackberry can quickly dominate land it invades. Blackberry threatens most of southern Australia, and thrives in a wide range of habitats due to its variability. It dominates pasture and native ecosytems, as well as invading disturbed sites in urban areas. Due to its presence in areas of human activity, it has a high profile as a weed species.

The challenge is to determine ways of reducing blackberry spread.

Its impact is very high
Blackberry competes strongly with preferred vegetation, in both production and natural ecosystems; it thereby reduces biodiversity, conservation values, and productivity. Farm productivity is reduced by displacement of preferred species, injury to stock, downgrading of product, and increased management costs. Natural ecosystems are affected by a decrease in biodiversity, the impact of feral animals harboured by blackberry thickets, and a decrease in ecotourism dollars as a result in reducing the desirability of the natural environment to the tourist.

The challenge is to develop and implement best management practices that limit the impacts of blackberry.

Management options
Management options for blackberry include a combination of biological control, chemical and mechanical control methods. However, opportunities exist to investigate additional means of control. This could include use of more biological control agents (eg. develop a suite of agents for several taxa) and combinations of other chemical and/or mechanical methods. Potential grazing management afforded by goats and deer may be an option on land already used for farming them, although the need to prevent feral populations being created is to be a priority.

The challenge is to expand the acceptance and implementation of best management practices to control blackberry.

Industry / Government involvement
Appropriate government departments have a public responsibility to reduce the impact of blackberry on public lands. Tourism and primary industries are major beneficiaries of reducing blackberry's agricultural impacts.

The challenge is to find ways to ensure private sector industries and government departments continue to take a leading role in blackberry management.

Issues are broad
The local impacts of blackberry infestations differ according to land use, stage of invasion, socioeconomic factors, and vulnerability of native flora and fauna.

The challenge is to identify best management practices for these differing taxa in various environments.

Rehabilitation of blackberry infested land is difficult
Replacement of weeds with native species is challenging, and specialised techniques and substantial resources may be required in many areas. Blackberry also occurs in agricultural areas where the economic value of the land may be below the costs of controlling the infestations, or the thickets may be in inaccessible areas where rehabilitation will be extremely difficult.

The challenge is to return social, agricultural and environmental values to land infested by blackberry.

BACKGROUND

European blackberry (*Rubus fruticosus* L. agg.) ("blackberry") is a Weed of National Significance. It is a highly invasive, variable weed of pastures, disturbed and waste areas, forests, and natural ecosystems throughout temperate Australia. Blackberry is a weed in all Australian states and the ACT (Figure 1).

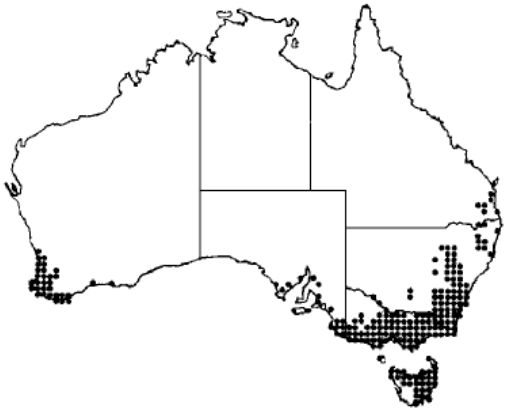

Figure 1. *Present, known distribution of blackberry in Australia(Parsons and Cuthbertson, 1992.)*

There are native blackberries that are not weeds. This strategy only refers to European blackberry however, introduced non-European blackberries are also present in Australia. They have mainly been introduced for cultivation, and have shown "weedy tendencies" in Western Australia, Victoria, New South Wales and the Australian Capital Territory.

Blackberry comprises a number of closely related plants that are dealt with under the one name. At least 15 taxa, some of which may be hybrids, of blackberry have become naturalized in Australia (*K. Evans* pers. comm.).

The European blackberry aggregate has probably reached the rainfall and temperature limits of its potential range in Australia. Individual taxa however, within the aggregate may not have reached their potential range.

1.1 The biology of blackberry

Blackberry has a two-year growth pattern (refer to Figures 2 and 3, and Table 1 below). A scrambling, semi-prostrate to almost erect plant, of biennial canes (stems), and a perennial root system.

Stems - Variable semi-erect canes which grow up to 7m in length, may be green, purplish, or red, generally thorny, moderately hairy, round or angled, sometimes bearing small, stalked glands.

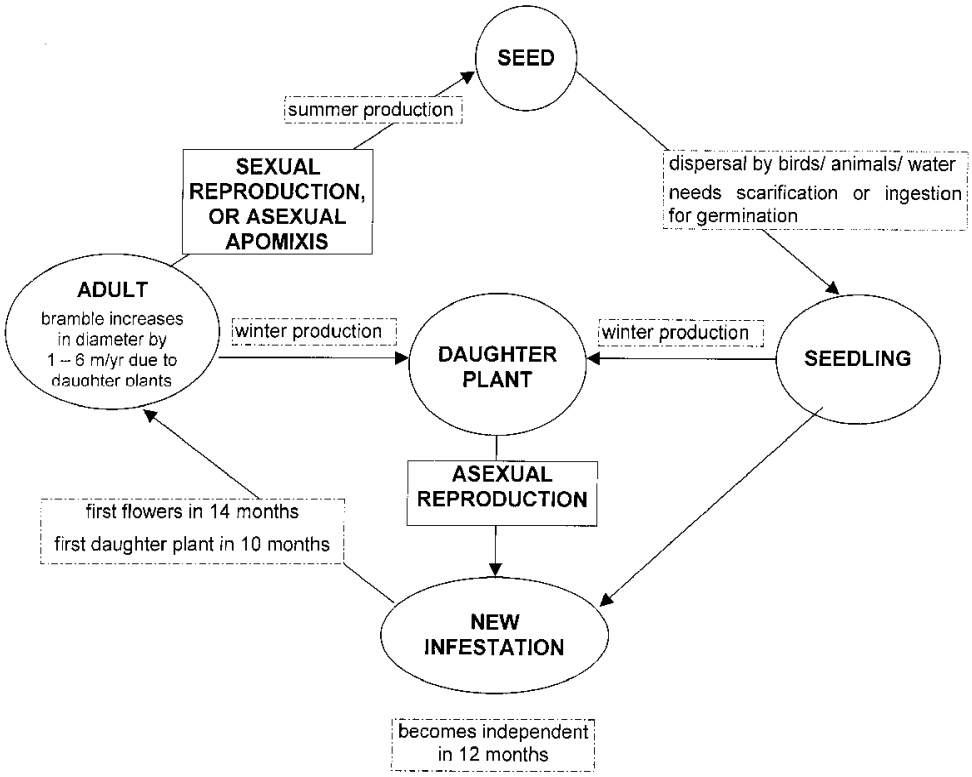

Figure 2. *Flow diagram of blackberry life-cycle.*

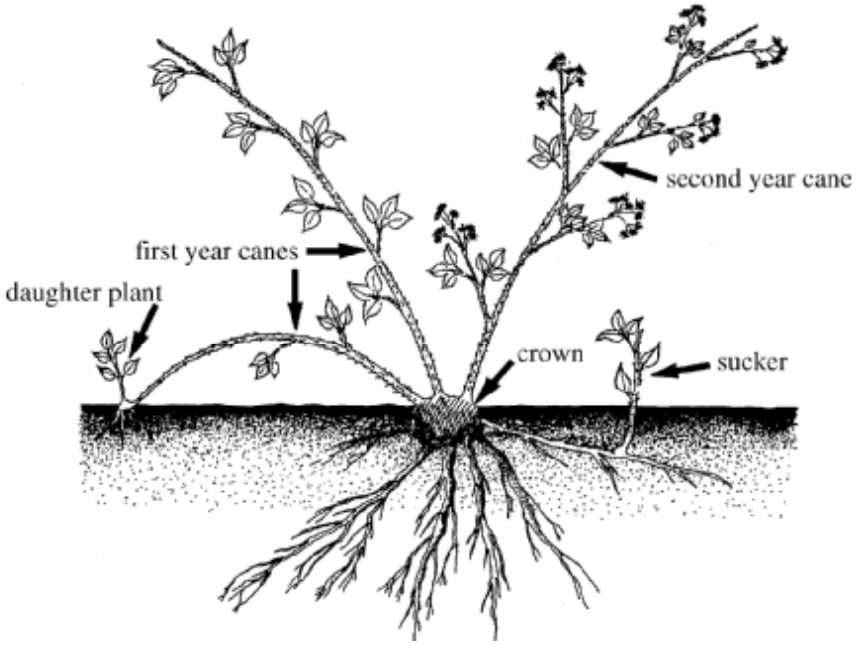

Figure 3. *Blackberry growth and reproductive morphology. (Source: Bruzzese and Lane, 1996.)*

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

	Winter			Spring			Summer			Autumn		
	Ju	Jul	Au	Se	Oct	No	De	Ja	Fe	Ma	Apr	Ma
Germination				■	■	■	▒					
Flowering (2 years old)						▒	■	■	▒			
Fruiting (2 years old)							▒	■	■	▒	▒	
Tip Rooting (1 year old)	▒	▒								■	■	■
Drought Stress							▒	■	■	▒		
Dormancy	■	■	■									

The shading denotes relative importance – dark for more important, light for less important.
(Source: Bruzzese and Lane, 1996.)

Leaves - Compound leaves are arranged singly, consisting of 3-5 shortly-stalked oval leaflets. Single leaves often occur around the flowering area. They usually have a dark green above, with a lighter green undersurface. Some taxa have their undersurface covered in pale hairs. Short "prickles" are found covering the leaf veins and stalks.

Flowers - Clusters of white or pink flowers, which are 2-3cm in diameter. From late November to late February (Figure 4).

Figure 4. *Blackberry flower and bud.*

Fruit - The fruit is a berry, changing colour from green to red to black as it ripens, with a diameter of 1-3cm (Figure 5). Each berry consists of an aggregate of fleshy segments, each containing one seed. Fruiting occurs from late December to April. The number of seeds in a berry depends on the taxon, but there can be as many as eighty.

Figure 5. *Typical blackberry fruit.*

Seeds - The deeply and irregularly pitted seeds are oval, light to dark brown, 2-3mm long.

Roots – The main root grows vertically to a maximum depth of 1.5m depending on soil type, from a woody crown up to 20cm in diameter. Secondary roots grow horizontally from the crown for 30-60cm, and then grow down vertically. Many thin roots grow in all directions from the secondary roots.

Vectors – The most prolific vectors of blackberry are birds, mammals (especially foxes), and water.

1.2 History of spread

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 into Adelaide for its fruit. It was included in the sale catalogue of a Tasmanian nursery by 1845. Blackberry was recognised to have become a significant weed by the 1880s, and first proclaimed a noxious weed in a region of Gippsland (Vic.) in 1894. There is some evidence that it was introduced independently into Western Australia (pers. comm. *N. Marchant*).

1.3 Impacts of blackberry

Blackberry's current impacts can be summarised as:

Economic:

- Up-to-date Australia-wide economic data need to be published, that allow for blackberry control, production losses, and ecological costs (tourism, *etc*).
- Parsons and Cuthbertson (1992) quoted an unpublished 1980s survey that estimated that the cost of blackberry control and primary production loss in New South Wales, Tasmania, Victoria and Western Australia to be in the order of $41.5 million annually. This figure is an underestimation, as it does not allow for all states and territories affected by blackberry, nor does it allow for the economic impacts on natural ecosystems.
- Recent estimates for Western Australia are $26.5M over a 20 year period for control of blackberry infestations (*R. Armstrong* pers. comm.).
- Blackberry control can be undertaken to minimise its spread to adjacent land and hence impose a substantial cost on forestry, local government, utilities and landholders with no direct benefit to themselves.

Biological:

- Blackberry can occupy space or grow over the top, and so prevent regeneration, of native vegetation.
- Increased cost of plantation forestry, particularly during the establishment phase by impeding access for manual silvicultural operations.
- Thickets of blackberry provide harbour, and its fruit a food source for pest animals such as foxes, and birds such as starlings and blackbirds, which further impact on local flora and fauna.
- Fire hazards are exacerbated by the substantial amount of dead material present in blackberry thickets.

Primary Production:

- Access to water and land, for management purposes, is reduced by the thickets, this restricts both agricultural and forestry operations.
- Reduced pasture production resulting from completion of resources.
- Property values have been substantially decreased, due to heavy infestations of blackberry.
- Accelerates soil erosion around the root mass along watercourses. This in turn results in an increase of sediments within the watercourses and spread of blackberry seeds downstream.

Tourism:

- Reduced ecological values for the Australian ecotourism industry with blackberry infestations potentially reducing the natural attraction of the bush. Visitors may have an incorrect perception of unique local landscapes.
- Recreational activities may be adversely affected where blackberry thickets prevent access to natural features.
- *Benefits:*
- Commercial collection of fruit for various culinary uses may be a minor offset to economic losses.
- Recreational fruit picking of blackberry fruit, valued by some in the community, is hard to quantify.
- In Tasmania particularly, blackberry pollen and nectar are an important resource for local honey production.

1.4 Legislation

Blackberry is declared noxious in NSW, Qld, SA, Tas, Vic, and WA. It is not yet declared in the ACT and NT.

It is expected that all Australian states and territories will review their noxious weed lists in the light of the Weeds of Natural Significance declarations.

It has been pointed out that for legislation to be fully applied with integrity, public land managers need to set a good example in blackberry management (Sorensen, 1998).

1.5 Management

In its long history as a noxious weed, blackberry has been "managed" by a range of control techniques. The range of methods include; burning (Mar – Oct), slashing, grazing, and "grubbing"; chemical spraying (September – January), and biological control during flowering (November – January) (Table 2). These methods are often used in concert with one another, however the program with the greatest likelihood of management success in the foreseeable future includes biological control. The defoliating leaf-rust fungus, *Phragmidium violaceum* (Blackberry Leaf Rust), affects the leaves. It can also be found growing on the flowers, unripe fruit, and young canes. The rust also slows the rate of spread and allows more time for control by other means. Biological control is most applicable for use on large, inaccessible infestations of blackberry.

For further management programs, refer to the *Best Practice Management Guide - #5*. (CRC for Weed Management Systems, In press.), or *The Blackberry Management Handbook* (Bruzzese and Lane, 1996).

1.6 Principles underlying the plan

This plan is based on the recognition and acceptance of four principles outlined by the *National Weeds Strategy*:

- Weed management is an essential and integral part of the sustainable management of natural resources and the environment, and requires an integrated, multidisciplinary approach.

- Prevention and early intervention are the most cost-effective techniques that can be employed against weeds.
- Successful weed management requires a co-ordinated national approach that involves all levels of government in establishing appropriate legislative, educational and coordination frameworks in partnership with industry, landholders and the community.
- The primary responsibility for weed management rests with land managers, but collective action is necessary where the problem is larger than the capacity of the individual land manager to address it adequately.

Table 2. *Optimum times for blackberry control methods.*

Management Option	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Herbicide Application	■	■	■	■					■	■	■	■
Mechanical Removal (inc grazing)	■	■	■	■	■	■	■	■	■	■	■	■
Burning			■	■	■	■	■	■	■	■		
Biological control – current agent release	■										■	■

1.7 Relevance to other strategies

The national *Blackberry Strategic Plan* has been established to provide a framework for co-ordinated management of blackberry across the country. The strategy has definite linkages to other national and state resource plans (Table 3). It particularly has relevance to any state or territory strategies that specifically refer to blackberry management (eg. the *Victorian Blackberry Management Strategy*, in preparation), which sit directly under it. In turn, all national strategies developed for the Weeds of National Significance sit directly under the *National Weeds Strategy*.

1.8 Socioeconomic factors

As 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. Because of these situations, some land managers may have reduced options for control.

In some areas with blackberry infestations, the primary impact is environmental, and this impacts on management funding priorities in comparison with other, agricultural weeds.

Significant community concern is aroused in many jurisdictions by people opposing herbicide spraying on the grounds that children and, to a lesser extent, adults may eat the fruit of treated plants. In some instances this prevents the use of herbicides as a control option.

Table 3. *Policy and Strategy Linkages*

Jurisdiction	Weed strategies	Related initiatives
Worldwide		• Agreements or conventions negotiated in United Nations or OECD forums • World Conservation Union
National	• *National Weeds Strategy* • Weeds of National Significance	• CRC for Weed Management Systems
Commonwealth	• Policies, strategies, plans and controls applied to Commonwealth lands (eg. Conservation and Military)	• World Heritage Areas • RAMSA Sites • Decade of Landcare • Natural Heritage Trust
Multi-state Regions		• Strategies under Murray-Darling Basin Initiative
State / Territory	• State weed strategies / plans • State strategies for Weeds of National Significance species • Listed community and species recovery plans • State biodiversity strategies,	• All State/Territory noxious weed and related legislation • Conservation strategies • State biodiversity strategies • Forest management plans • River, estuary and wetland policies
Regional and Local	• Regional and/or local weed plans and species strategies • Catchment / vegetation management plans	• *State of the Environment* reports • Regional environmental plans and other regional initiatives • Regional forest agreements • Development control plans • Landcare groups and plans
Utilities	• Rail, road, and utility corridor management plans	• Environmental impact assessments
Local Governments	• Local government pest management plans	• Local laws • Local conservation strategies • Local Agenda 21 programs • Integrated local area planning
Neighbourhood	• Community action strategies	• Landcare groups and plans, roadside conservation and other greening projects
Land / Property	• Management plans for land managers • Control schedules • Property / farm management plans	• Incentive schemes • Land For Wildlife

2 STRATEGIC PLAN

VISION

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

Desired outcomes 1 and 2 are interdependent; *i.e.* to effectively achieve outcome 1, you need outcome 2, and *vice versa*.

2.1 Prevent, contain and rehabilitate blackberry infestations.

Desired Outcome

Reduce and mitigate the invasion of blackberry, and promote rehabilitation of significant production and natural ecosystems.

Objectives

The spread of blackberries from infested land to currently uninfested areas is to be minimised.

Reduce the repeated weed reinfestation of previously "managed" land by effective rehabilitation.

Assess, and act on the economic, environmental and social impacts of blackberry.

Background to the goal

Land managers need to be pro-active to prevent introduction and establishment of blackberry (and all other weeds). Land managers must use all methods available to control blackberry. "Clean" areas must be kept blackberry-free whenever possible; and those land managers with blackberry already present need to control it, and moderate its impacts.

Accurate and thorough mapping of the current blackberry problem is essential. This is a prerequisite for determining where treatment is required and the selection of appropriate control methods. The full range of impacts of blackberry will be influenced by the local prevalence of blackberry.

As with all weed control, rehabilitation of the treated area is vital. Without adequate rehabilitation, re-infestations of the same, or new, weeds is a likely outcome. The introduction of favoured vegetation both deters re-infestation, and restores the preferred landscape for production or environmental values.

Performance indicators

An accurate and thorough assessment of the current blackberry problem is made.

Areas for blackberry treatment are identified and prioritised.

A clear understanding of the economic, social, and biodiversity impacts of blackberry, and its treatment(s) are appreciated.

Increased resources regarding blackberry management projects and planning are apparent.

Outcomes

The spread of blackberry across Australia is slowed.

The area and density of blackberry throughout Australia is reduced.

Land rehabilitated to a desired state for primary production, landscape management and nature conservation purposes.

Strategy	Actions	Responsibility*	Priority
2.1.1 Identify and prioritise blackberry infestations.	**a** Assess current blackberry infestations in terms of cover, density and potential impacts on surrounding lands.	• State + Territory Governments • Land Managers	1
	Minimisation of strategic blackberry infestations by external or internal sources.	• State + Territory Governments • Land Managers	1
	b Reduction of blackberry outbreaks by all landholders.	• State + Territory Governments • Land Managers	1
2.1.2 Assess the impacts of blackberry infestations.	**a** Identify the economic, environmental and social impacts and impediments to blackberry management.	• State + Territory Governments • Land Managers • Community Groups	1
	b Determine cost/benefit analysis for blackberry management option(s).	• State + Territory Governments • CRC WMS • Land Managers	1
2.1.3 Develop rehabilitation schemes.	**a** Investigate appropriate local vegetation to replace treated blackberry.	• State + Territory Governments • Greening Australia • Land Managers • Landcare • other Community Groups	2
	b Demonstrate revegetation methods as quickly as possible.	• State + Territory Governments • Land Managers • Landcare • other Community Groups	2
2.1.4 Minimise introduction of *Rubus* taxa which have potential to invade the Australian environment.	**a** Test each taxon proposed for importation into Australia for "weediness" before acceptance to import given.	• AQIS	1

* Universities may also be able to contribute to several actions.

2.2 Adoption of "best practice" management.

Desired Outcome

Adoption of "best practice" management options, using CRC guidelines as a starting point.

Objectives

Develop and implement "best management" practices for blackberry, in consultation with key stakeholders.

Establish and maintain means of communication between land managers.

Background to the goal

Best management practices chosen to manage blackberry infestations will differ according to the specific situation being dealt with. Some variables that will impact on the choice of treatment options are; whether the infestation is extensive and established, or newly identified from a small number of discrete plants; whether land is easily accessible or not; whether or not land is riparian, or part of a run-off zone for waterways. For "best management practices" to be widely adopted by the Australian community, general knowledge and acceptance of these options need to be widespread. This means an effective communication and extension plan needs to be put into place.

Further research is an inherent ongoing requirement for weed management. Additional agents for blackberry control in different circumstances are required, eg. blackberry infestations thriving under canopies. Refer to Appendix 3 for further research needs.

Regular evaluation of chosen management options is crucial, as it will highlight any methods that can be improved upon, added to the options, or discarded as no longer working.

Performance indicators

Implement, and monitor "best management practices".

Establish and implement an effective communication and extension plan.

Establish a range of incentive schemes for the ongoing treatment of blackberry, and the necessary hygiene methods.

Gaps in knowledge regarding the "best" management of blackberry are identified.

Annual evaluation reports are published.

Outcomes

"Best management practices" are widely communicated to, and adopted by land managers.

Further research (Appendix 3) into efficient blackberry management is undertaken, and results communicated to land managers.

"Best management practices" are continually monitored, and re-evaluated in light of new research.

Strategy	Actions	Responsibility*	Priority
2.2.1 Identify additional "best practice" management options.	**a** Determine appropriate herbicides, the "best" methods and times to apply them, and liaise with states and chemical companies to register them.	• State + Territory Governments • CRC WMS • Industry	1
	b Assess biological control options, and other integrated management options, eg. replacement by other preferred species, or grazing.	• State + Territory Governments • CRC WMS	1
2.2.2 Identify and fill in gaps in knowledge.	**a** Gaps in knowledge are identified, and research to elucidate knowledge needed is undertaken (eg. evaluate biological agents currently available in Australia).	• State + Territory Governments • CRC WMS • Industry	1
	b Re-evaluate management techniques in light of recent research.	• State + Territory Governments • Industry • Land Managers	1
	c Monitor outcomes and compile data every two years to re-evaluate efficacy of techniques, impact levels, and chosen management methods.	• State + Territory Governments • Industry • Land Managers • Community Groups	1
2.2.3 Implementation of "best practices".	**a** Communicate with land managers, and set targets at realistic levels.	• State + Territory Governments • Regional Managers • Land Managers	2
	b Develop criteria for selection of appropriate management options.	• CRC WMS • Regional Managers • Land Managers	2
2.2.4 Establish and implement a communication plan.	**a** Develop and implement extension methods.	• State Governments • Regional Managers • CRC WMS • Community	2
2.2.5 Establish evaluation code.	**a** Assess the resulting density and distribution of blackberry infestations after treatment.	• State + Territory Governments • Regional Managers • Land Managers	3

* Universities may also be able to contribute to several actions.

2.3 National commitment to the effective management of blackberries is maintained.

Desired Outcome

On-going and coordinated commitment to blackberry management is established and maintained by the Australian community.

Objectives

Blackberry is recognised as an important noxious weed by the states and territories, local governments, and other land managers.

An on-going national blackberry taskforce is established.

Identify the different land managers with responsibilities for blackberry management, and develop cooperative links.

National blackberry research programs are initiated and coordinated.

Background to the goal

Blackberry management will need to be a long-term goal, not merely a “quick-fix”.

To harness national commitment the Weeds of National Significance program needs to be supported by all the Australian States and Territories, and backed by legislation.

There is a need for a national blackberry taskforce to direct research and management options. The facilitation of information exchange between state/territory agencies, and between these agencies and land managers would also be a beneficial outcome of a taskforce. It is recognised that some states may already have active taskforces looking into blackberry management.

Performance indicators

The establishment of a national blackberry taskforce.

Complementary legislation for blackberry’s status (and other Weeds of National Significance) is proclaimed throughout its Australian range, both current and possible.

Cooperative research into blackberry management is continued.

Outcomes

The recognition of blackberry as a significant Australian weed is reconfirmed, and concerted determination to manage it nationally is obvious.

Alternative control options are being researched throughout Australia, with research staff communicating with one another.

Strategy	Actions	Responsibility	Priority
2.3.1 An on-going national blackberry taskforce is established.	**a** Appropriate representatives are nominated, and a national taskforce established within 1 year.	• State/Territory Governments	**1**
	b Taskforce nominees to familiarise themselves with the proposed Terms of Reference (Appendix 2),	• Taskforce	**1**
2.3.2 Blackberry is recognised as an important noxious weed by the states and territories, local governments, and other land managers.	**a** Blackberry's current status is reviewed throughout Australia, and its control legislatively tightened where necessary.	• Taskforce + • State/Territory Governments + • Land managers	**1**
2.3.3 Identify the different land managers with responsibilities for blackberry management, and develop cooperative links.	**a** Recognise the different land managers that need to control blackberry infestations.	• Taskforce + • State/Territory + Local Governments + • Land managers	**2**
	b Develop cooperative links between these differing land managers.	• Taskforce + • State/Territory + Local Governments + • Land managers	**2**
2.3.4 National blackberry research programs are initiated and coordinated.	**a** As per research aspects of Goal 2.	See Goal 2	

3 MONITORING AND EVALUATION

Monitoring

This strategic plan needs to be subject to a five-year cycle of review.

A national taskforce for blackberry should be established to monitor and evaluate the efficacy of this strategy, and the related action plans that are involved with blackberry control.

As the strategic actions from Goals 1 and 2 are developed and implemented, the performance of the preceding steps may be assessed.

Performance indicators

A range of performance indicators for the blackberry plan actions are listed below:

- Increased awareness and action on blackberry problem at all levels throughout Australia.
- A clear understanding of the economic, social and biodiversity impacts of blackberry, and its treatment(s) is sought.
- An accurate and thorough assessment of the current blackberry problem is made.
- Areas for blackberry treatment are identified and prioritised.
- Gaps in knowledge regarding its management are identified.
- Research carried out to fill gaps in knowledge.
- Continue to refine and implement “best management practices”.
- Establish and implement an effective communication and extension plan.
- Establish a range of incentive schemes for the ongoing treatment of blackberry, and the necessary hygiene methods.
- Increased resources for blackberry management projects and planning.

4 STAKEHOLDER ROLES AND RESPONSIBILITIES

All land managers, both public and private, shall achieve the highest level of control possible.

It must be recognised that this is a massive weed problem and that all stakeholders including government have a responsibility to adequately fund and resource its control.

State or territory government departments with responsibility for conservation, environment and resources

To ensure that the social, economic and environmental impacts of blackberry are kept to a minimum throughout Australia, by ensuring blackberry control is undertaken in all State managed parks, including;

- National Parks and Reserves (of various categories)
- State Parks
- State Forests

Other state or territory government departments and utility companies

To ensure blackberry management is undertaken on all State managed lands throughout Australia, including;

- State road reserves,
- Unallocated state land (vacant crown lands).

Federal government departments and corporations

Ensure quarantine controls on entry of blackberry (AQIS)

To ensure uptake by Departmental staff to restrict movement of weeds (agencies that manage land and travel on non-government land)

To ensure blackberry control is undertaken on all federally managed lands (Defence, Environment Australia and other Commonwealth departments/ corporations that manage land)

Oversee and manage federal funds including Natural Heritage Trust and National Weed Program (Environment Australia, Agriculture, Forestry and Fisheries – Australia).

Local governments

To ensure that social, economic and environmental impacts of blackberry are kept to a minimum throughout each local government area.

Community groups

- "Friends of" and other community groups encouraged to actively manage weed infestations (including blackberries) on public lands, with guidance from the appropriate public land managers.

Private land managers

To control blackberry on their own lands including specific actions;

- Include blackberry management in property management plans.
- Encourage participation in catchment groups.

Community groups

- Landcare groups to actively manage weed infestations (including blackberries) on private lands, with the approval and guidance of the land manager concerned.

Industry

- Industry will benefit from the actions resulting from the national *Blackberry Strategic Plan*. Thus it is reasonable to expect their full involvement where it is to their economic advantage.

5 ADDITIONAL READING

Identification:

Department of Natural Resources (Vic.). (1998) *Blackberry*. Pest Fact sheet PP9.
Department of Natural Resources and Environment (Vic.). (1998) *Blackberry: Landcare Note* Pp0018.

Parsons, W.T. and Cuthbertson, E.G. (1992) *Noxious Weeds of Australia*. Inkata Press, Melbourne.

Management:

Bruzzese, E. and Lane, M. CRC for Weed Management. (1996) *The Blackberry Management Handbook*. Department of Conservation and Natural Resources (Vic).

Bruzzese, E., Mahr, F., and Faithful, I. In Press. *Blackberry, Rubus fruticosus: Best Practice Management Guide. #5.* CRC for Weed Management Systems.

Bruzzese, E and Tenni, A. M. (1992) *Biological Control of European Blackberry by the Rust Fungus, Phragmidium violaceum*. Landcare Note BC009. Department of Natural Resources and Environment (Vic).

Richarson, R.G. and F.J. (Eds.) (1998) Proceedings – Blackberry Workshop. *Plant Protection Quarterly*. **13**(4).

Other:

James, R. and Lockwood, M. (1998) Economics of blackberries: current data and rapid valuation techniques. *Plant Protection Quarterly.* Vol. **13 (4):** 175 –179.

Mackey, A.P. (1996) *Blackberry in Queensland*. Pest Status Review Series. Department of Natural Resources (Qld).

6 ABBREVIATIONS and GLOSSARY

ABBREVIATIONS

AQIS	Australian Quarantine and Inspection Service
CALM	Department of Conservation and Land Management (W.A.))
CRCWMS	Cooperative Research Centre for Weed Management Systems
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DNR	Department of Natural Resources (Qld.)
DPI	Department of Primary Industries, Water and Environment (Tas.)
KTRI	Keith Turnbull Research Institute, NRE
NRE	Department of Natural Resources and Environment (Vic.)
NWSEC	National Weeds Strategy Executive Committee

GLOSSARY

Land Manager	Any person involved in land management, both public and private.
Taxon	A group of species that share a relationship, at any level of a system for classifying living things.
Taxa	Plural of “taxon”.

Appendix 1. Process Used To Develop The National Blackberry Strategic Plan

The national *Blackberry Strategic Plan* is the product of several years of planning. A workshop was held at Agriculture Victoria - Attwood (Melbourne) on 30th November, 1999, which lead to the development of the national strategy released in June 2000.

Individuals and Organisations that contributed to the national Blackberry Strategic Plan:

The lead agency for the formation of the national *Blackberry Strategic Plan* was the Department of Natural Resources and Environment (Victoria).

Collators - Sarah Keel, BSc (Hons), Patrick Pigott, MSc and Eligio Bruzzese, BAgSc

The delegates at the November national workshop, that developed the outline for the strategy and commented on the resultant document, were;

- CALM, W.A. (Mr Frank Batini),
- CRCWMS (Mr El Bruzzese, Dr Kathy Evans, Dr Richard Groves, Dr John Hosking, Mr Patrick Pigott, Prof Rick Roush - by correspondence)
- CSIRO (Dr Richard Groves, ACT)
- DPI, Tas. (Mr Tim Rudman)
- KTRI (Mr El Bruzzese - Science Director, Ms Sarah Keel, Mr Patrick Pigott)
- NRE, Vic. (Parks Flora & Fauna, Mr Hugh Bramwells)
  (Pest Plants & Animals, Mr David McKenzie)
- NSW Agriculture (Dr John Hosking, Mr Hugh Milvain)
- NSW State Forests (Mr Michael Hall)
- University of Adelaide (Dr Kathy Evans)
- Victorian Blackberry Taskforce (Mr Alex Arbuthnot - Chair),

Facilitator:

- Mr John Thorp (Project Manager, National Weeds Strategy)

Additional feedback from the public release of the draft strategy was received from:

- Agriculture Victoria
- CALM, (W.A.)
- CRCWMS
- DNR (Qld.)
- DPI (Tas.)
- Forestry Tasmania
- NRE (Vic.)
- NSW Agriculture
- University of Adelaide

Appendix 2. Proposed National Blackberry Taskforce

Draft Terms of Reference

- Co-ordinate the implementation of this strategy and monitor progress.
- Co-ordinate the specific planning activities necessary within this strategy.
- Review and update the strategy biannually.
- Report annually to the NWSEC, with the report available to all stakeholders.

Appendix 3. Research and Extension Opportunities

- Increase community awareness of “best” management practices for blackberry in both agricultural and natural situations.
- Minimise the impact of herbicides used to control blackberry along waterways / riparian systems.
- Develop efficient and effective management options for widespread infestations, concentrating on natural suppression through the use of biological control.
- Concentrate on further biological control options for blackberry growing in situations where current biological control is not effective.
- Monitor the long-term effectiveness of any biological agents released.
- Develop and encourage community participation in weed management planning including weed mapping, setting priorities for control, as well as the release and monitoring of biological control agents.
- Due to the complicated taxonomy of the current blackberry infestation, monitor changes in the species-mix due to the impact of control measures and biological control.