



**REVIEW OF THE PROGRESS TOWARDS THE
BRIDAL CREEPER
STRATEGIC PLAN
(2006 – 2007)**

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On behalf of the National Asparagus Weeds Management Committee

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EXECUTIVE SUMMARY

Background.

Bridal creeper *Asparagus asparagoides*, is a South African vine that has invaded tens of thousands of hectares of Australian remnant native vegetation in regions with temperate climates. Its annual above ground growth smothers native shrubs and herbs, while its perennial, tuberous root system forms thick, impenetrable, underground mats impeding regeneration of native flora. Other weedy *Asparagus* species naturalised in Australia mirror the significant threat posed to biodiversity by bridal creeper

National Coordination and funding.

The management of bridal creeper and the other asparagus weeds is coordinated at a national scale. A national management strategy was developed in 2000. The National Bridal Creeper Management Coordinator (Coordinator) under the direction of the National Asparagus Weeds Management Committee (NAWMC) manages implementation of the strategy. The project is funded through the Australian Government's *Defeating the Weed Menace* (DWM) program with matching in-kind support from State departments, research institutions, and community representatives. Funding of \$68 000 was received from DWM for national coordination in this reporting period. Since 1996 bridal creeper management has attracted \$6.8m in Australian Government funding, matched by state and community in-kind contributions.

Major outcomes for the period 2006 / 2007

- **Eradication of the common bridal creeper from Tasmania and South East Queensland.** Efforts to achieve total eradication in these regions, within ten years, continue with intensive mapping followed up with on-ground control work. The Tasmanian infestation has been reduced from 1100ha to 350ha
- **Containment of the Western Cape form of bridal creeper.** Chemical control and mapping successfully undertaken of the two known infestation sites. Projects funded from DWM to the value of \$300 000 with matching State and community funds. The Western Cape form is not susceptible to biological control.
- **Reduced impact on biodiversity.** CSIRO and Department of Primary Industries Victoria (DPI Vic.) continued the strategic release of the three biological control agents used for the management of bridal creeper at a national scale. The Coordinator ran 14 workshops and meetings in regional centres to encourage the use of integrated management techniques incorporating the redistribution of agents from the CSIRO and DPI Vic. release sites. Community groups and State land management officers undertake thousands of agent releases annually.
- **Understanding of pathways for weed spread.** Potential and current distribution maps completed. The potential spread of all species of weedy asparagus has been mapped using climate-matching models. A weed risk analysis of each species is under development to compliment the maps.
- **Increased public education and weed awareness.** Launch and distribution of the *Asparagus Weeds Best Practice Management Manual*. 1500 printed copies of the document have been distributed to land managers throughout Australia in addition to the 3100 visits to the website where the electronic version is posted.

Progress against the Bridal Creeper Strategy

The majority of the objectives within the national strategy have been met. Two biological control agents are present and replicating naturally throughout bridal

creeper's growth range and information on best practice management of *Asparagus* species is widely available. The outstanding objectives in the strategy are deemed no longer appropriate or will be achieved within the next reporting period.

Future priorities.

Research into the slow decay of bridal creeper tuber mats, post-control, is considered a priority area for the future. Modelling predicts the tuber mats may take between eight and twenty years to decay, slowing the regeneration of native vegetation.

BRIDAL CREEPER STRATEGIC PLAN

1. Introduction

Bridal creeper, *Asparagus asparagoides*, is a South African vine that has invaded Australian native vegetation in regions with temperate climates. Its annual above ground growth smothers native shrubs and herbs. Its perennial, tuberous root system forms thick, impenetrable, underground mats, which impedes regeneration of native flora and changes the chemical composition of the soil. Bird and animal dispersal of seed has enabled rapid spread within and between remnant stands of native vegetation.

Bridal creeper poses a major threat to biodiversity and conservation. It is widespread in Western Australia (WA), South Australia (SA) and Victoria (Vic.). There are many scattered infestations across New South Wales (NSW), with potential for these to spread significantly. In Tasmania (Tas) and Queensland (QLD) there are small, scattered infestations which have been targeted for eradication.

Other weedy asparagus species naturalised in Australia mirror the significant threat posed to biodiversity by bridal creeper. Birds, foxes and rabbits act as vectors for *Asparagus* species. The suite of threatening asparagus species includes *A. declinatus* (bridal veil) in SA, WA and Vic. *A. aethiopicus* (ground asparagus) along the NSW and QLD coastline, *A. africanus* (climbing asparagus) in QLD and *A. scandens* (asparagus fern) throughout southern Australia.

The National Bridal Creeper Strategy (NBCS) incorporates objectives to manage all weedy asparagus species. Since 2000, NBCS has been implemented under the direction of the National Asparagus Weeds Management Committee (NAWMC) with the National Asparagus Weeds Management Coordinator (Coordinator) acting as executive officer to NAWMC and strategy project manager.

To date, the outstanding successes of the strategy have been the establishment of biological control agents across the country; the development and distribution of a best practice management manual; and the raising of awareness of the threat posed by all asparagus weed species in Australia. These successes represent the majority of the objectives set out in the Bridal Creeper Strategy. Those outstanding represent objectives that have been deemed by the NAWMC to be no longer relevant or that will be accomplished in the next reporting period.

The Australian Weeds Committee has developed a program for the review of the strategy by an independent auditor in late 2008, which is predicted to agree with the NAWMC assessment that the current strategy's implementation is nearing completion and that a new direction must be developed in the near future.

These reports details the achievements made towards the successful implementation of the National Bridal Creeper Strategy during the 2006 / 2007 financial year.

2. Review of Actions.

Strategy 2.1 Commit and coordinate

Desired outcome: The community and governments recognise bridal creeper as a major environmental threat and are committed to its management.

National Coordination

The successful implementation of the NBCS continued in 2006/2007 under the management of the Coordinator, directed by the NAWMC. The group met face-to-face in February 2007 to discuss the progress made to date and plan for the anticipated independent review scheduled for late 2008. NAWMC held two teleconferences during the year. The Australian Government's *Defeating the Weed Menace* (DWM) program provided funding to the value of \$68 000 for the Coordinator's position and the running of the Committee. All states and organisations with representatives on the Committee provided matching in-kind support. The focus for the reporting period was to engage the Western Australian weed community, specifically regional groups; to distribute the best practice manual; to engage communities in regions where management was seen to be strategic or lacking; to ensure the continuation of the national biological control release program and to ensure the containment of the Western Cape form of bridal creeper.

Australian Government and in-kind funding

Commitment to implementing the national management strategy has been most effective where Australian Government funding has fostered national, state and regional projects. Since 1999, \$6.5m has been invested into asparagus weeds management from Environment Australia, Natural Heritage Trust, Envirofund, Coast and Bushcare and the DWM programs. For every Australian Government dollar allocated, matching contributions have been received as in-kind support from State departments, research institutions and community volunteer groups. Australian Government funding received in the reporting period was valued at \$900 000. Projects funded included the continuation of the CSIRO-led redistribution of biological control agents; DPI Vic's redistribution program; protection of threatened fauna and flora in Tasmania; control of the Western Cape form of bridal creeper; regional rust fungus redistribution programs; and support for friends groups working in conservation parks. Figure 1 illustrates the State, community and Australian Government funds expended on asparagus weeds management since the project's inception.

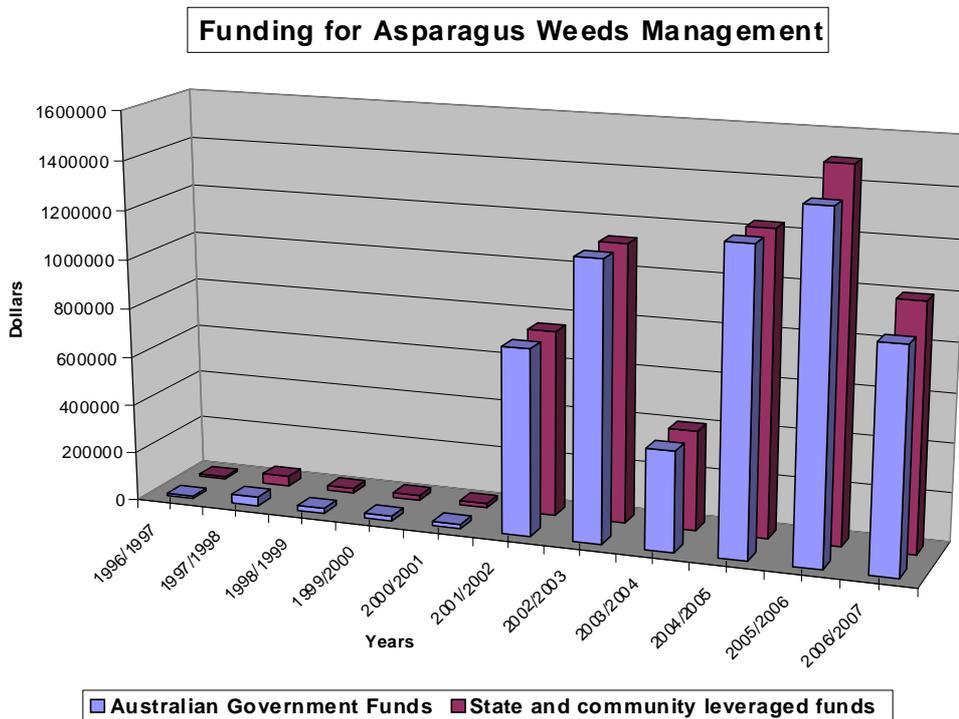


Figure 1: Australian Government and leveraged funding

Rapid response to new incursions

The rapid response from various levels of government to the discovery of a new form of bridal creeper illustrates the success of a nationally coordinated approach to managing this weed. In 2005, a second form named the Western Cape bridal creeper was confirmed to be growing in the border region between SA and Vic. The discovery was significant as research indicated that mature plants are resistant to the rust fungus released as a biological control for the common bridal creeper.

Funding from the DWM program, with state in-kind support, allowed for an initial survey of the area (commissioned by NAWMC) to establish the growth range of the weed and to produce a list of environmental assets most at risk. A copy of the report can be found at <http://www.weeds.org.au/WoNS/bridalcreeper/>. Further funding from DWM and Envirofund, matched by Vic. state departments and the SA South East Natural Resource Management Board (SENRM) saw on-ground management of the weed commence in the winter of 2006 under the direction of a regional working group. The Coordinator played an important role in the formation of the working group, chairing initial meetings, assisting in the development of a work plan and writing funding applications.

A national awareness campaign was conducted, resulting in the discovery of a second infestation in the Adelaide Hills. The Coordinator and the NAWMC provided coordination and resources for the initial survey of this infestation with support from SA State departments. This survey was followed by a more in-depth survey and the development of a work plan funded by the Adelaide and Mount Lofty Ranges NRM Board. The

Coordinator worked with the SENRMB to have the work plan funded through the last round of DWM.

Funding and management plans for the strategic on-ground management of the weed are in place until June 2008. The Coordinator is continuing to work with the regional groups to ensure long-term management.

Communication and community engagement.

Communication of ideas, available resources and successes are key to encouraging participation in the national control effort. The Coordinator circulates a regular newsletter to a database of 400 people. The recipients are a mix of State weeds officers, community groups and interested individuals. Three newsletters were distributed in the reporting period. Copies can be obtained from the bridal creeper webpage at <http://www.weeds.org.au/WoNS/bridalcreeper/>

Since 2000, CSIRO and DPI Vic. have conducted workshops to instruct land managers on biological control release techniques as part of the national release program. The knowledge base has been expanded with the land managers's in-turn conducting their own release workshops. In 2006 / 2007, the Coordinator held fourteen workshops and meetings in areas deemed to have not received sufficient coverage. Areas included regional WA, Vic., NSW, Tas and SA. The targeted audiences were decision makers within the new NRM structures, biodiversity officers, works managers and community weeding groups. Participants were given information on identifying asparagus species, control techniques, and access to information. Locations of the meetings are displayed on the map in Appendix 2.

The bridal creeper webpage is regularly updated and actively marketed as the central resource point for land managers looking for control information. The site contains papers pertaining to asparagus weeds delivered at the Nov 2005 Asparagus Weeds Workshop, the 15th Australian Weeds Conference, reports commissioned by NAWMC, interesting research papers, an electronic copy of the best practice management manual, MS-PowerPoint presentations on biological control release techniques and back copies of the newsletter. A measure of the website's success is the number of visits, or hits, which are recorded to the page. Between December 2006 and August 2007 the site recorded 3142 hits to the best practice manual. The April 2007 newsletter attracted 780 hits (Thorp 2007).

Natural Resource Management Mosaic Map

The Victorian community effort to manage bridal creeper with the release of biological control agents has been recognised with the inclusion of the project on the Australian Government's Natural Resource Management website. This site is dedicated to showcasing projects supported by the Australian Government, which are improving the biodiversity of Australia. The full article is available at <http://www.nrm.gov.au/projects/Vic./ppwe/2006-08.html>

Strategy 2.2 Eradicate and prevent spread

Desired outcome: High value natural assets are protected from invasion by bridal creeper.

State declarations.

Bridal creeper has been declared in all States and Territories. The declaration ranges from the prohibition of movement and sale in NSW, WA and Vic., eradication if found in Northern Territory and QLD. and the requirement of landholders to control infestations in NSW, SA, Tas and the ACT. The declaration of all asparagus weeds is currently under review in Vic. The Coordinator has been encouraging the inclusion of bridal veil (*A. declinatus*) and the strengthening of the bridal creeper legislation.

Mapping of asparagus infestations and risk assessment.

Mapping has continued at regional, State and national scales. Intensive mapping of bridal creeper infestations has continued in Tas. as a pre-cursor to eradication. National distribution maps, which reflect both current and potential distribution based on climatic matching, have been developed for nine asparagus species. The maps reflect the national distribution pattern as well as each individual states divided into NRM regions. NAWMC is currently undertaking a weed risk assessment for each species. On completion, the maps and risk data will be forwarded to the relevant NRM regions. Figure 2 is the national map of bridal creeper and serves as an example of the detail shown for each species. The maps were developed in consultation with all states and were subject to a limited period of public consultation.

Current and potential distribution of *Asparagus asparagoides**

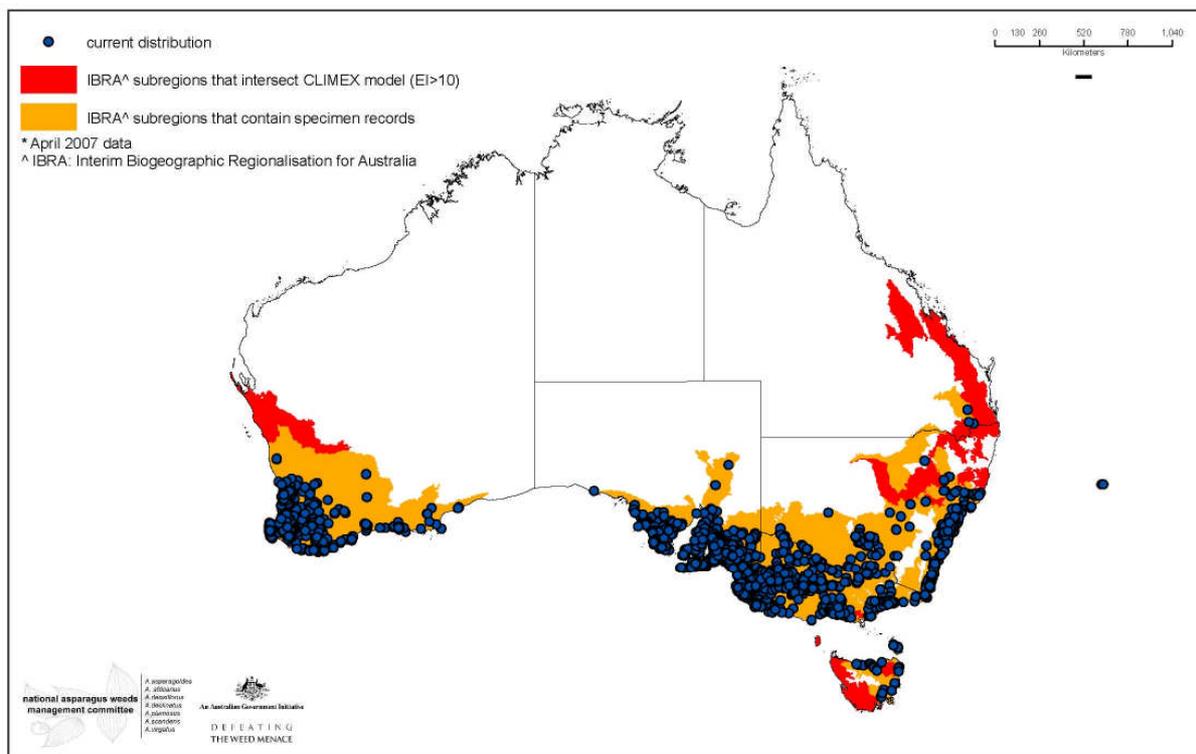


Figure 2: National current and potential distribution map for common bridal creeper.

The objective of the mapping and the weed risk assessment is to assist organisations—both State and community based—to determine their current and future priorities, and plan appropriately. A complete set of maps is available from the Coordinator. Examples of the State maps are displayed in Appendix 3.

Containment and eradication.

Containment and eradication projects continue at State, regional and local levels. The project of the greatest potential benefit is the eradication of common bridal creeper from Tas. The intensive mapping, site prioritising, and treatment are ongoing. The infested area has been reduced from 1100ha at the start of the project in 2001 to 350ha in 2006. The project has been funded through combined contributions from DWM and regional NRM boards. A similar project for Kangaroo Island in SA is targeting isolated infestations in the west of the island for eventual eradication. A small infestation in the Crows Nest Shire Qld. measuring approximately 500m along a roadside is under eradication.

Managing the Western Cape form of bridal creeper.

Containment of the two Western Cape bridal creeper infestations began in the winter of 2006 and will continue in 2007. The area covered by the weed is approximately 60ha, 40 ha in the Green Triangle (SE SA and SW Vic.) and 20ha in the Adelaide Hills. While no measure has been made of the success of the management works to date, preliminary reports indicate that all known infestations will be treated with herbicide by the end of Winter 2007. The success of the programs will be measured with the re emergence of the weed in the 2008 growing season. Public education forms an important part of both projects. The Coordinator has developed a brochure illustrating the differences between the bridal creeper forms and encouraging the public to report suspicious plants. Four thousand copies were printed and circulation to land holders in areas where management is being undertaken. The location of the two infestations are illustrated on the map in Appendix 2

Development of extension material.

Education of land managers is key to preventing the further spread of asparagus weeds. The NAWMC developed the *Asparagus Weeds Best Practice Manual* to assist in the education process. The manual is a 96-page full colour document, which details the distribution, identification features, and best practice control methods for six of the worst asparagus weeds. The weeds covered are common bridal creeper, bridal veil, asparagus fern, ground asparagus, climbing asparagus and the Western Cape form of bridal creeper. The manual contains a detailed section on developing a weed management plan aimed at ensuring the long-term success of projects undertaken by inexperienced land managers. Project funding to the value of \$38 000 was received from DWM with equivalent in-kind support from SA, QLD and WA state departments and the Weed CRC. Senator Eric Abetz launched the manual at the 15th Australian Weeds Conference.

Two thousand copies of the manual were printed. It was the decision of NAWMC that the distribution would be carefully targeted at individuals who could disseminate the information to an even wider audience. The concept was to send a hard copy to the individual who would then in turn direct others to the relevant section available on the website. To date 1590 copies have been distributed nation-wide with nine copies being sent overseas. Figure 3 illustrates the number of copies distributed per state. The Coordinator is satisfied that the strategic distribution of the manuals reflects the need for information in the community. An electronic version of the manual is available at <http://www.weeds.org.au/WoNS/bridalcreeper/>. Web browsing

statistics indicate that the manual page received 107 visitations in July 2007 alone (Thorp 2007).

A DL brochure illustrating the asparagus weeds present in Australia and directing readers to the manual on the website was developed. Six thousand copies were printed. Two thousand copies have been circulated in WA, inserted into community environment newsletters. The balance will be made available for distribution at workshops, conferences, and public displays across Australia.

Seven cards for the *WEEDeck* identification system have been developed or updated for asparagus weeds including bridal creeper. Four hundred sets were printed, to be distributed to NRM and Local Government authorities. The cards also form part of the weed identification tool on the Weeds Australia website.

Funding for both the DL brochure and the *WEEDeck*, amounting to \$10 000, was obtained from the DWM program.

In South Australia, NRM weeds officers and state representatives formed a working group to manage bridal veil at a state level. The group developed an identification fact sheet, which has been distributed to land managers in areas threatened by bridal veil. State departments and regional NRM Boards shared funding responsibilities.

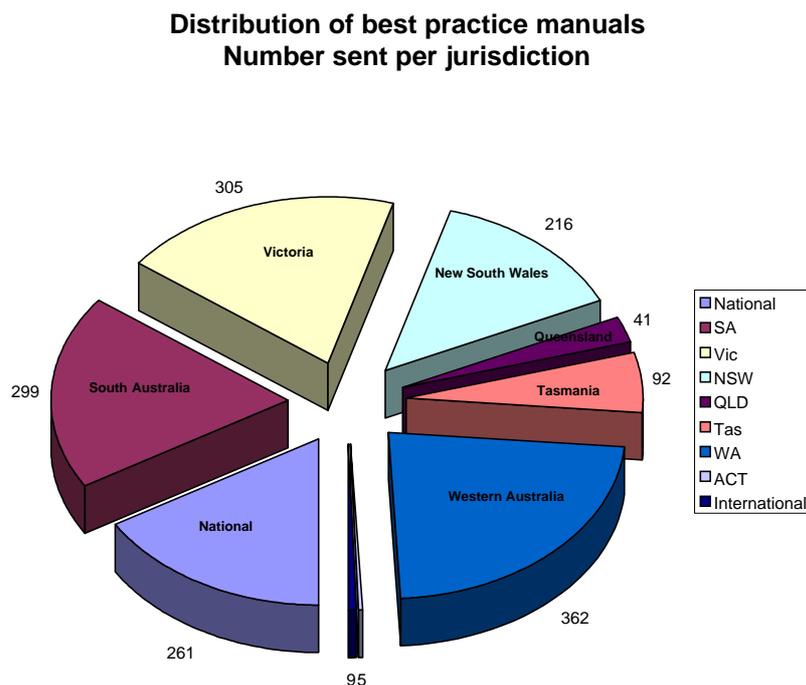


Figure 3: Distribution of asparagus best practice manuals.

Strategy 2.3 Reduce existing impacts

Desired outcome: Bridal creeper is managed to reduce its density and occurrence.

Distribution of biological control agents

The major, ongoing success at a national scale has been the CSIRO-led bridal creeper biological control release program started in 1999. The objective has been to establish agents in all affected states except VIC., which has a parallel distribution program. To date, 2500 releases of leafhopper, rust fungus and the leaf beetle releases have been made across Australia. These release operations occur in conjunction with community groups, schools, private landholders, weeds officers and park rangers. A map detailing the locations of the releases can be found at http://www.ento.csiro.au/weeds/bridalcreeper/release_sites.html

The project will continue through to June 2008, having received funding to the value of \$220 000 through DWM in 2007. Releases will be predominantly made in NSW, as this region did not receive as intensive coverage in past years. The funding will allow additional releases in Vic., concentrating on the Murray River Valley irrigation region. Apart from releasing control agents, the project will complete the evaluation of the impact the agents have had on bridal creeper growth and reproduction.

An ongoing objective of NAWMC is to encourage land managers to harvest biological control agents from the sites established through the CSIRO and DPI Vic. projects and establish new sites. The development of the “spore water” distribution method by a community group on Kangaroo Island has assisted in the rapid spread of the rust fungus. The task of the Coordinator has changed from encouraging the wide spread adoption of biological control agents as a management tool to coaching land managers on a more integrated approach to bridal creeper management, involving both biological control agents and herbicides.

Regional Asparagus Weeds Working Groups

NAWMC continued to encourage and support existing regional asparagus working groups and facilitate the development of others. Various regional groups operate in SA and Vic. The Coordinator is currently facilitating the development of a group in QLD. The location of current working groups are illustrated on the map in Appendix 2

Research conducted in reporting period.

Forestry SA has undertaken research to ascertain effective chemical control of the Western Cape bridal creeper. The preliminary information was circulated to all weed officers controlling the weed. The final report will be published on the bridal creeper webpage in December 2007. A second project was undertaken to establish whether the use of treated town water would alter the efficacy of spore water. Results have been posted onto the bridal creeper webpage.

Future research required.

The long-term impact of the dead tuber mat left in the soil after bridal creeper plants have been killed is not well understood. Preliminary investigations indicate that the tuber mass may take longer than eight years to decompose. While in the soil it forms an impenetrable barrier stopping recruitment of desirable flora. Research into management techniques to overcome this barrier will be required to aid recovery of biodiversity.

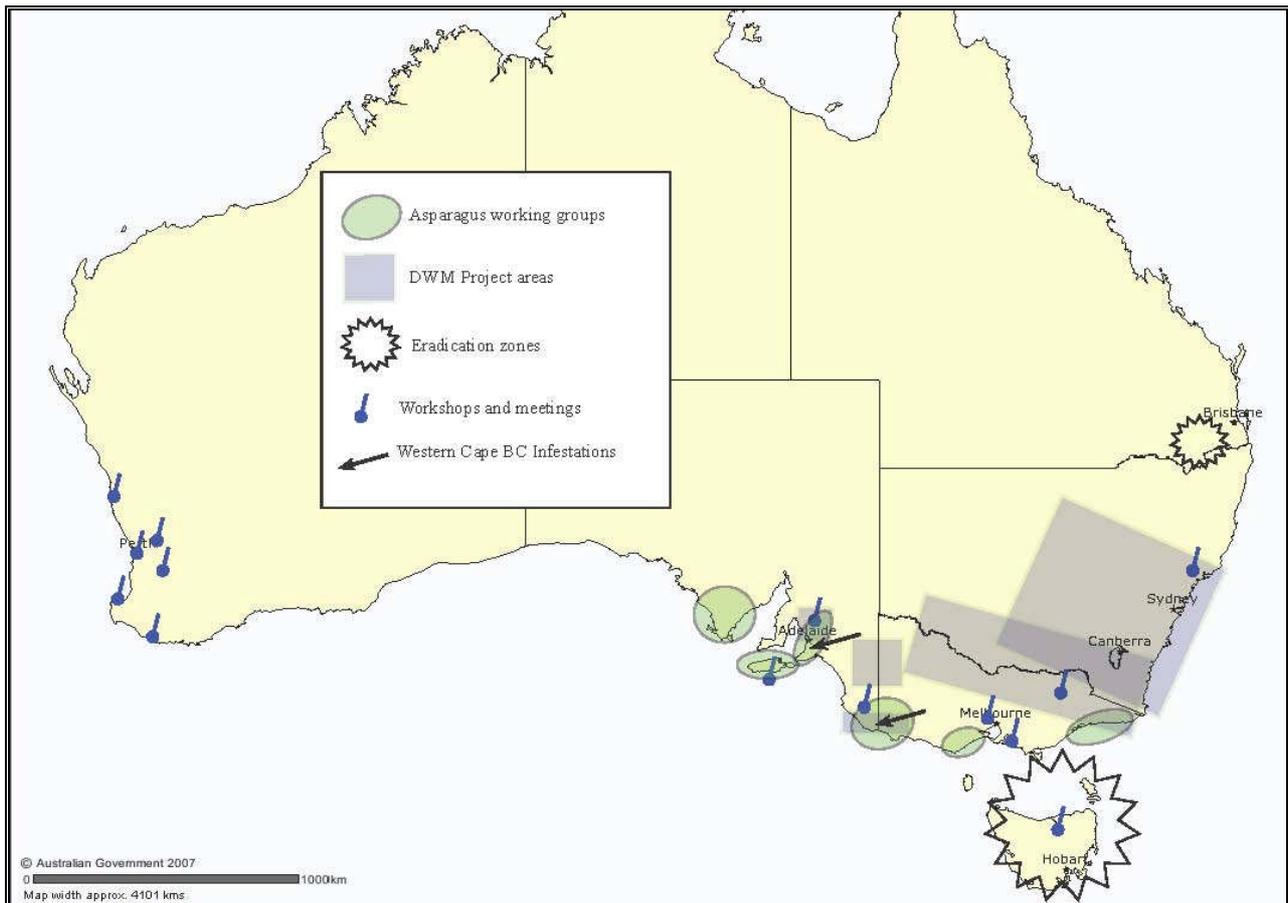
REFERENCES

Thorp, J. 2007. *Usage Statistics - Weeds Australia (includes Weedbusters, Weeds Search)* www.weeds.org.au Online at <http://www.jta.com.au/access/>. Last accesses 15/08/07

APPENDIX 1 - National Asparagus Weeds Management Committee As at 30 August 2007

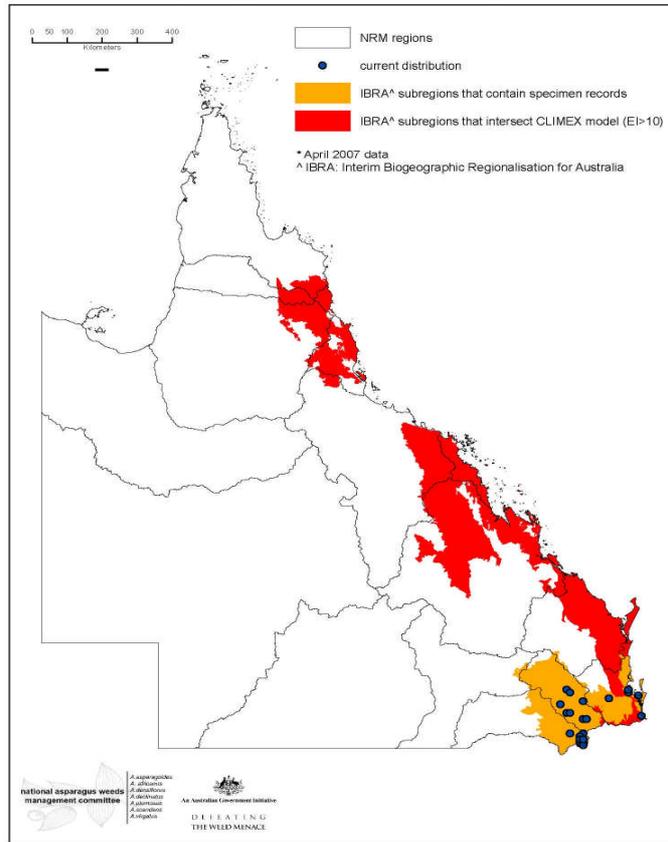
- Greg Lefoe, - Department of Primary Industries Victoria
- Louise Morin, - CSIRO (ACT)
- John Virtue, - Department of Water Land & Biodiversity Conservation (SA)
- Kathryn Batchelor, - CSIRO Entomology (Western Australia)
- Paul Downey, - Department of Environment and Conservation (NSW)
- Dennis Gannaway, - (Executive Officer) Bridal creeper Management Coordinator
- John Thorp (ex officio), - National Weeds Management Facilitator
- Gabrielle Vivian-Smith, - Department of Natural Resources (QLD)
- Sue Longmore, - Swan Bay Catchment Facilitator (Vic.)
- Greg Stewart, - Weed Management Coordinator North Coast NRM (Tasmania)
- Mae Adams, - (Chair) Community rep from Venus Bay (Vic.)
- Dean Overton, - Community Rep from Kangaroo Island (SA)
- David Lane, - Department of Primary Industry and Water (Tas)

APPENDIX 2 – Location map of workshops, DWM projects and regional working groups.

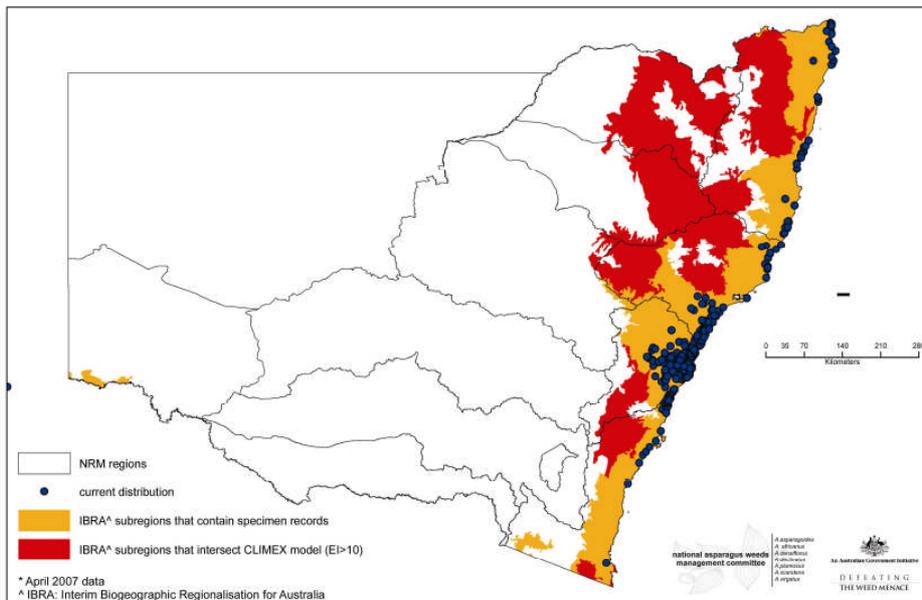


APPENDIX 3 – Asparagus weeds current and potential distribution maps

Current and potential distribution of *Asparagus officinalis* in Qld*



Current and potential distribution of *Asparagus aethiopicus/densiflorus* in NSW*



Appendix 4. Project Budget and Expenditure

Continuation of the National Bridal Creeper Co ordinator Position									
Defeating the Weed Menace Funding Income									
DWM Income	1-May-06		\$68,358		DWM Funds Spent	\$93,560			
	1-Jan-07		\$68,358						
Total			\$136,716		DWM funds remaining	\$43,157			
Budget vs. Actual Expenditure									
Budget				Actuals				Variance	
		State In Kind	Federal	Total Budget	State In Kind	Federal	Total Actuals		
Employees									
National Coordinator		\$78,000	\$117,000	\$195,000	\$37,952	\$46,594	\$84,546	-\$110,454	
Dr John Virtue (SA)		\$29,300		\$29,300	\$13,232		\$13,232	-\$16,068	
Dr David Cooke (SA)		\$6,765		\$6,765	\$3,055		\$3,055	-\$3,710	
Mr Mark Ramsey (SA)		\$8,680		\$8,680	\$3,920		\$3,920	-\$4,760	
DPIWE (TAS)		\$13,700		\$13,700	\$6,187		\$6,187	-\$7,513	
DEC NSW		\$38,000		\$38,000	\$17,161		\$17,161	-\$20,839	
DPI Vic		\$7,700		\$7,700	\$3,477		\$3,477	-\$4,223	
CSIRO Entomology		\$18,000		\$18,000	\$8,129		\$8,129	-\$9,871	
DIME QLD		\$6,800		\$6,800	\$3,071		\$3,071	-\$3,729	
Mr Greg Stewart		\$6,225		\$6,225	\$2,811		\$2,811	-\$3,414	
Ms Sue Longmore		\$6,225		\$6,225	\$2,811		\$2,811	-\$3,414	
Sub Total		\$219,395	\$117,000	\$336,395	\$101,808	\$46,594	\$148,402	-\$187,993	
Operating cost item									
Interstate Travel			\$37,500	\$37,500	\$0	\$15,932	\$15,932	-\$21,568	
Intra State Travel		\$7,500		\$7,500	\$2,903	\$0	\$2,903	-\$4,597	
Admin, Office support		\$15,885		\$15,885	\$7,174	\$0	\$7,174	-\$8,711	
Training		\$2,500		\$2,500	\$1,129	\$0	\$1,129	-\$1,371	
Community Awareness		\$2,000	\$6,500	\$8,500	\$903	\$13,208	\$14,112	\$5,612	
Workshops / forums		\$3,000	\$5,000	\$8,000	\$1,355	\$3,000	\$4,355	-\$3,645	
Workshops State reps.		\$2,500		\$2,500	\$1,129	\$0	\$1,129	-\$1,371	
NAWMG expenses		\$3,000	\$22,800	\$25,800	\$1,355	\$9,234	\$10,589	-\$15,211	
Community rep expen.			\$8,500	\$8,500	\$0	\$3,712	\$3,712	-\$4,788	
State rep expen.		\$2,500		\$2,500	\$1,129	\$0	\$1,129	-\$1,371	
Mapping			\$1,575	\$1,575	\$0	\$0	\$0	-\$1,575	
Cost benefit analysis			\$5,000	\$5,000	\$0	\$0	\$0	-\$5,000	
Auditing costs			\$1,200	\$1,200	\$0	\$1,880	\$1,880	\$680	
Sub total		\$38,885	\$88,075	\$126,960	\$17,077	\$46,966	\$64,043	-\$62,917	
Project total		\$258,280	\$205,075	\$463,355	\$118,885	\$93,560	\$212,445	-\$250,910	