
The Cradle Coast boneseed incentive program

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Summary

The Cradle Coast Natural Resource Management (CCNRM) region is located in northwest Tasmania and covers approximately one third of the state. Boneseed (*Chrysanthemoides monilifera* subsp. *monilifera* (DC.) T.Norl.) is an emerging weed threat in the region and has been recorded at around fifteen sites along the northern coastline and on King Island. Community groups have successfully controlled boneseed at many sites in the region however other sites have had no control.

In 2006, CCNRM initiated a strategic approach to controlling boneseed in the

region. An incentive program was developed to provide financial support and technical advice to landowners. This program enabled boneseed control at eleven sites with a total area of 34.3 ha treated. An area of approximately 60 hectares remains to be surveyed and controlled, and boneseed is known to be present at various densities throughout this area.

In 2007, CCNRM worked together with the other two Tasmanian NRM Regions (Northern and Southern NRM) and the National Boneseed Coordinator to develop a funding application to address outlying boneseed populations in Tasmania. This

application received successful funding from the Australian Government's Defeating the Weed Menace program and will enable the CCNRM region to complete the initial boneseed control programs initiated in 2006, as well as initiate the remaining programs outlined in CCNRM's boneseed strategy.

All on-ground works are governed by a contract, which obliges landowners to continue controlling boneseed on their land for a total of three years. Landowners are supported in this work by ongoing assistance and guidance from CCNRM, and in some cases by local government. All boneseed control sites are mapped, with data stored on a central database. This database is used to generate letters to landowners, providing timely annual reminders for boneseed follow up control. Successful implementation of this program will help deliver on the Tasmanian Boneseed Strategy and will ensure that significant progress is achieved towards the eradication of boneseed in the CCNRM region.

Community weed education initiatives in New South Wales: getting school children involved

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In these days of mounting cutbacks, funding the successful introduction and deployment of weed biological control agents has become increasingly difficult. One of the most successful strategies for achieving deployment success has been coordinating the involvement of community interest groups. Input from these groups has varied from assistance with site selection to rearing and releasing agents as well as monitoring the impact of agents at selected sites.

Weed Warriors

The latest initiative in community based biological control projects is Weed Warriors, a national program designed for schools that aims to increase awareness and actively involve students in the management of local weed issues. The

program is funded nationally by the Natural Heritage Trust and the Cooperative Research Centre for Australian Weed Management, with State agencies and Natural Resource Management regions contributing on a local level. Students work closely with local weed officers, land managers and community groups to implement a biological control program for a regional priority weed. This program has recently been introduced to schools in New South Wales with bitou bush (*Chrysanthemoides monilifera* spp. *rotundata* (DC.) Norl.) as a primary target weed and the *Tortrix* sp. leaf rolling moth as the agent.

Weed resources for schools

In addition to the Weed Warriors program, the NSW Department of Education and Training is developing *Weeds: Educate to*

Eradicate. This school education program is being created in partnership with education experts, land managers and weed scientists. The program, which is funded through the Australian Government's Defeating the Weed Menace initiative, uses integrated classroom learning tools to increase weed awareness among young Australians (i.e. upper primary and lower secondary students). Interactive teaching resources, including web-based and multimedia materials, are being developed. One such resource is entitled *Weeds Attack!*, which is a series of computer-based modules that will lead students through a range of educational challenges while teaching them about the impact of weeds. These resources will be incorporated with existing weed education programs such as Weed Warriors to provide a complete

package for teachers to educate students about the impacts of weeds, while fulfilling curriculum requirements.

The program is initially being developed around the 20 Weeds of National Significance (using bitou bush in the first iteration) and resources will include agricultural and environmental weed information. The resources will conform to national curriculum standards to allow national adoption. Students will inves-

tigate the impacts of weeds on a global scale and learn about weed science principles and weed impacts to biodiversity and the environment. They will also work with local weed managers and community groups, as part of the Weed Warriors program, to implement a biological control program for a locally significant weed, thus empowering students to apply effective weed control measures in their local community.

Weeds: Educate to Eradicate is an innovative approach to raising weed awareness among young Australians by educating students using integrated learning tools. The partnership developed in the program will provide expertise for state-wide implementation and the capacity to foster national expansion of the project.

Bitou bush aerial spraying in New South Wales – what have we learned?

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Summary

Developing the aerial boom spraying methodology

Bitou bush (*Chrysanthemoides monilifera* subsp. *rotundata* (DC.) T.Norl.) is a significant environmental weed in coastal New South Wales (NSW). Control of extensive infestations of bitou bush within native vegetation can be undertaken using aerial herbicide application. Aerial spraying to control bitou bush proved to be a suitable control option following herbicide studies on native plant species which showed they were tolerant to the aerial application at very low rates during winter months (Toth *et al.* 1993). This technique was developed following ground based herbicide trials carried out in the late 1980s near Jervis Bay, NSW, in which six herbicides were initially trialled for the control of bitou bush. At the same time, a permit was granted to deliberately apply the same herbicides to seven native plant species, being *Acacia longifolia* subsp. *sophorae* (Labill.) Court, *Banksia integrifolia* L.f., *Casuarina glauca* Sieber ex Spreng., *Leptospermum laevigatum* (Gaertn.) F.Muell., *Leucopogon parviflorus* (Andrews) Lindl., *Monotoca elliptica* (Sm.) R.Br. and *Lomandra longifolia* Labill., to determine their response to off-target damage associated with bitou bush control. The results showed that only herbicides containing glyphosate or metsulfuron methyl as the only active ingredient were effective for controlling bitou bush (Toth *et al.* 1996). In addition, the effect of low rates of glyphosate on the native species produced no measurable damage, and low rates of metsulfuron methyl resulted in only

ephemeral damage to *L. laevigatum* and *L. parviflorus*. Hence these two herbicides proved sufficiently selective for bitou bush (Toth *et al.* 1993).

A subsequent trial was undertaken to examine the seasonal sensitivity of bitou bush to glyphosate and metsulfuron methyl. These herbicides were also trialled to determine an effective application rate for bitou bush control amongst native species. The two-year trial indicated that bitou bush is at least twice as sensitive to glyphosate in winter than during summer, especially following peak winter flowering (Toth 1997). There was no apparent trend with metsulfuron methyl. Effective bitou bush control during the winter was also achieved with very low rates of both herbicides. Similar seasonal and rate trials were subsequently carried out on five of the native plant species, being *A. longifolia* subsp. *sophorae*, *B. integrifolia*, *L. laevigatum*, *L. parviflorus* and *L. longifolia* to examine if there was also a seasonal and application rate tolerance. The results showed a seasonal tolerance of these native plants to low rates of herbicides applied during winter. However, seedlings of *A. longifolia* subsp. *sophorae* showed some sensitivity to glyphosate (Toth *et al.* 1996). The combined results indicated that low rates of glyphosate and metsulfuron methyl applied during winter not only controlled bitou bush, but were unlikely to result in significant off-target damage to native plant species.

Independently, Anderson (1989) trialled aerial boom spraying of bitou bush at 8 L ha⁻¹ of glyphosate [four times the

current rate] at South Stradbroke Island which showed control was selective for bitou bush with little damage to native species. However subsequent examination showed that three species may be adversely impacted (see Toth *et al.* 1996); further analysis of these three species following control at 2 L ha⁻¹ shows that such impacts are likely to be reduced at the lower application rates currently used.

A series of herbicide trials were then carried out using aerial boom spraying in NSW in which very low rates of glyphosate (2 L ha⁻¹ of Roundup® (36 g L⁻¹ glyphosate)) and metsulfuron methyl (30g L⁻¹ of Brushoff® (600 g kg⁻¹ metsulfuron methyl)) were applied to bitou bush infestations. These results supported the original ground based trials described above.

Penetrants were also trialled during the ground based herbicide applications for glyphosate and metsulfuron methyl. The addition of Pulse® (1020 g L⁻¹ polyether modified polysiloxane) had a negative effect on *L. laevigatum* in that it led to a greater degree of leaf burn. Based on this result Pulse® has not been recommended for use in the aerial spraying of bitou bush (Toth *et al.* 1996).

A further trial in 1997 examined the potential use of Roundup Bioactive® (36 g L⁻¹ glyphosate) for aerial spraying of bitou bush, however, the results indicated that Roundup Bioactive is more phytotoxic to the following five native plant species *Scaevola calendulacea* (Andrews) Druce, *Carpobrotus glaucescens* (Haw.) Schwantes, *Myoporum boninense* Koidz. and *Correa alba*