

## A catchment approach to parkinsonia control – can it be done?

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**Summary** The Cape Catchment (2.1 million ha) in north Queensland has been successful in controlling parkinsonia (*Parkinsonia aculeata* L.) across the top of the catchment, despite delays due to drought, delays in obtaining vegetation management permits and legislative impediments. At least fourteen previously infested beef-grazing properties are free of parkinsonia, subject to annual follow up. This has occurred due to active participation by graziers, success stories being shared across neighbouring properties, availability of best practice research, mapping the catchment, efficient leadership by the community-based committee of two government-funded projects and the projects interlocking with an effective and active Pest Management Plan process administered by the Dalrymple Shire Council.

Seventeen properties in the middle and lower part of the Cape Catchment are controlling larger areas with Graslan<sup>®</sup> and mechanical control, predominantly with the Ellrott front-mounted bladeplough. The impetus is there and landholders are working together to protect, maintain, follow up and advance this major investment in woody weed control. In conjunction to this impetus, the Dalrymple Shire Council audits properties and their pest management plans on a regular basis. The shire is ensuring follow up to parkinsonia management. A 97% success rate in engaging neighbouring properties in a large catchment to work collectively towards managing a woody weed is a credit to all those involved. This catchment control program cost \$518,000 of federal and state government funding and \$1,020,000 contribution from graziers and other in-kind.

**Keywords** Cape Catchment, parkinsonia, catchment approach, Ellrott bladeplough, Graslan<sup>®</sup>.

### INTRODUCTION

The Cape River Catchment occupies one third of the Dalrymple Shire and is situated to the south and west of Charters Towers in the Burdekin Rangelands of north Queensland. The 2.1 million ha catchment is predominantly open eucalypt savanna, interspersed with *Acacia* scrubs (Isbell and Murtha 1972). There

is over 1500 kilometres of frontage to the numerous tributaries of the Cape and Campaspe Rivers, which provides an excellent environment for woody weeds like parkinsonia (*Parkinsonia aculeata* L.) and rubber vine (*Cryptostegia grandiflora* R.Br.). The soils are predominantly phosphorus-deficient yellow earth, with the narrow, fertile, alluvial soils bordering the streams being the most productive areas for cattle production and important biodiversity areas (Landsberg 2005). Cape River Catchment includes 70 beef cattle stations, five irrigation farms and the White Mountains National Park. Of these, 32 stations were infested with parkinsonia.

The thrust for a catchment approach to woody weed control was triggered by the initial round of the Australian Government Natural Heritage Trust 1 funding for riparian fencing in 1996. Rubber vine infested large areas of frontage country and burning was considered the best practice management. Riparian fencing enabled graziers to control stock grazing pressure along watercourses. Land condition improved, pasture competition against weeds increased and sufficient fuel was built up to implement fire management of rubber vine. In the Cape Catchment, 60 properties erected 1200 km riparian fencing throughout the five-year project.

Parkinsonia is a Weed of National Significance (WoNS) that spreads primarily by the movement of water. The ecology and threat of parkinsonia is described in the National Case Studies Manual (Deveze 2004). It is commonly found growing in riparian areas, floodplains, surrounding natural wetlands and dams. Control was spasmodic, with some Cape Catchment landholders undertaking various degrees of control and others taking no action at all. The common complaint was that most did not have the financial and physical resources to undertake large scale programs and those that did were frustrated by constantly having to re-treat seedling growth and/or re-infestation from upstream (Landsberg 2005). Furthermore, substantial regrowth had occurred after some control treatments. The situation was partly attributable to a lack of information about the most appropriate

control practices for different densities of parkinsonia in different habitats. Some coordinated approach using a range of control mechanisms was needed. Further research into the physiological aspects of parkinsonia was also required.

The Dalrymple Landcare Committee Inc along with five sub-catchment landcare groups within the Cape Catchment, the Dalrymple Shire Council, research agencies (Tropical Weeds Research Centre from the Department of Natural Resources, Mines and Water and CSIRO) and a registered training organisation (Rural Industry Training Extension) have implemented a catchment approach to parkinsonia management. A steering committee for this project (Cape Catchment Woody Weeds Sub Committee) was formed with representatives from all the major stakeholder groups. The management committee harnessed the incentive capabilities of government programs such as the WoNS (\$197,800) and Queensland Department of Primary Industries and Fisheries Burdekin Rangelands to Reef Initiative (\$320,000) to engage the majority of landholders in the area to undertake strategic control programs. The project period was from April 2002 to February 2005.

Implementing weed control programs across catchments is not so much about killing weeds as engaging and empowering people. Although the monetary value of these funding initiatives is relatively small compared to the enormity of the problem, when leveraged with landholder funds and in-kind assistance from various research and extension agencies (\$1,020,000), the community is getting more than a 2:1 return on its investment in terms of weed control, improving water quality and biodiversity protection (Landsberg 2005).

#### METHODS AND RESULTS

**Initial planning** As a requirement of the *Land Protection (Pest and Stock Route Management) Act 2002*, Dalrymple Shire Council had commenced collating and mapping pest plant infestations throughout the shire using the 'PestInfo' database system. This mapping information was a planning tool for use between the shire and landholders and was generally not available to other organisations. Roger Lawes from CSIRO was engaged by the management committee and funded through the WoNS project in October 2002 to conduct an aerial survey of the principal rivers, creeks and floodplains of the Cape Catchment (1100 km) to identify the presence, absence and abundance of Parkinsonia (Lawes *et al.* 2003). The shire and CSIRO maps were used as the major planning tool to identify strategic locations in the upper and lower catchment that were targeted for management.

**Control strategies** During the period that cost-effective, best practice management methods were being researched by the Tropical Weeds Research Centre (Queensland Department of Natural Resources, Mines and Water), the best outcomes were being put into practice in this project. Isolated scattered infestations across the top of the catchment were basal-bark sprayed by weed spray teams and landholders. A large-scale best practice management trial at Leura Station in central Queensland demonstrated dense infestations of parkinsonia were effectively treated by either applying a soil-applied residual herbicide (Graslan or Velpar<sup>®</sup>) or mechanical control (ideally using a manoeuvrable front-mounted Ellrott bladeplough or a normal bladeplough). These methods were adopted into the Cape Catchment parkinsonia project after three members of the project steering committee attended the parkinsonia field day at the trial site. Velpar could not be used in the Cape Catchment due to restrictions imposed by the *Vegetation Management Act 1999*. There is potential for lateral movement of Velpar in soil, which poses a risk to off-target native tree species. A total of 4150 kg of Graslan was applied to dense infestations of parkinsonia across fifteen properties.

The Queensland Department of Primary Industries and Fisheries Burdekin Rangelands to Reef Initiative (BRRI) provided funds for herbicide and operating expenses for two four-person weed spray teams to operate on property weed control programs. Twenty-four properties with scattered parkinsonia infestations were covered by this project during 2002 to 2004 and more would have been involved if the seasons had not been so dry. Although it is difficult to ascertain the collective area of scattered parkinsonia treated, a total of 1240 litres of Access<sup>®</sup> was used throughout the project. Weed spray team members provided a total of 1375 hours to the project to basal-bark spray and apply Graslan. Landholders provided the diesel, transport and accommodation for the teams. Most landholders were extremely pleased with the outcomes.

Perhaps one of the most significant outcomes from the WoNS funds was the trial of the Ellrott plough for parkinsonia control in the Cape Catchment. The Ellrott plough is a blade plough attached to the front of a bulldozer and is designed to sever the root systems of woody weeds 100 mm to 400 mm below the ground. Its design allows a high degree of manoeuvrability and trash throughput, causing minimal damage to native woody plant species and making it a very effective control mechanism for parkinsonia and other woody weeds in riparian areas. The added advantage of the Ellrott plough is the ability to regenerate pastures by opening up the soil and allowing better moisture infiltration and mulching. Its main attraction is its cost

effectiveness. It is up to 10 times cheaper than using manual labour for conventional basal bark spraying of herbicide and diesel (Landsberg 2005, John Lyons pers. comm.). The plough started in the catchment in June 2004, following early delays because of interpretation of the *Vegetation Management Act 1999* and the requirement for permits before weed control could take place. Frank Ellrott was contracted for 525 hours in the project and employed for an additional 300 hours by a number of landholders after they saw the effectiveness of the plough. Three landholders and contractors associated with the Cape Catchment subsequently purchased Ellrott ploughs.

A parkinsonia fire management research trial conducted in 2003 demonstrated mortality of 30 to 86% using a range of head fires and back burns with a fuel load ranging between 3000 to 4000 kg ha<sup>-1</sup> (Grice *et al.* 2004). Fuel loads are the key to effective fires. During the project period (2002–05) the Cape Catchment received below average rainfall and fuel loads were insufficient to consider fire as a management tool. In 2006 fire has been used as a follow up treatment to a few areas mechanically controlled with the Ellrott plough.

#### CONCLUSION

The co-ordination process was possibly the most frustrating aspect of implementing this large scale weed programs, particularly when there were so many landholders involved was. Getting people organised to do things concurrently was a challenge and was even more difficult when the weather was so variable. (Landsberg 2005).

The impetus is now there and the 32 landholders are working together to protect, maintain, follow up and advance this major investment in woody weed control. In conjunction to this impetus, the Dalrymple Shire Council audits properties and their pest management plans on a regular basis. The shire is assisting to ensure follow up to parkinsonia management and, if required, to coerce a few 'inactive' properties into action through legislation available within the *Land Protection (Pest and Stock Route Management) Act*

2002. There was only one property that was not active during the parkinsonia catchment control program due to logistics, time and other reasons. A 97% success rate in engaging neighbouring properties in a large catchment to work collectively towards managing a woody weed is a credit to all those involved. Subject to annual follow up, 14 infested properties in the upper catchment are now free of parkinsonia. Seventeen lower catchment properties have reduced infestations. Strong project leadership, use of mapping as a key tool for a catchment approach to weeds, an offer of government funding to support weed management efforts, working in conjunction with applied researchers, realising the value of peer pressure and activity across neighbouring properties and having the backing and support from a shire council that is actively implementing the Pest Management Plan were the key ingredients in this successful approach to parkinsonia management in the Cape Catchment.

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