

Management Plan for the control of *Acacia nilotica* Nulla-Nulla



SUMMARY

Western Australia was thought to be free of prickly acacia (*Acacia nilotica*) until the discovery of one plant on the side of the Duncan Road on Nicholson Station in the East Kimberley in 2002. Another plant was found in the quarantine yards just outside Kununurra in September 2003.

In October 2003 a further infestation of prickly acacia was detected in the East Kimberley on the Indigenous community of Nulla-Nulla. The outbreak consists of plants spread across 10,000 hectares of floodplain and associated creek systems that run into the western side of Cambridge Gulf and the Durack River. Density varied from scattered plants to very dense stands and is the largest infestation found to date out side Queensland. The infestation is in a remote and inhospitable area which is seldom visited by people other than two or three families who are the Traditional Owners of the area. It is estimated that the infestation has existed for over twenty years. The source of the infestation is unlikely to be determined; however, it is thought that infested stock or machinery may be involved.

In 2005 another infestation consisting of a couple of hundred plants was discovered on the Pentecost River upstream of the Nulla-Nulla infestation. Extreme wet season flood events and the constrained topography of the Cambridge Gulf downstream of Nulla-Nulla are thought to have combined to spread the plant upstream whilst cattle are considered to be the main vehicle for the plants spread where it has become established.

INTRODUCTION

Prickly acacia is a small thorny spreading tree generally growing to about 465 m high and occasionally to 10 m. It is usually single stemmed. The bark of young trees has a tinge of orange and/or green. Older trees have dark, rough bark and tend to lose most of their thorns. The green, fern-like leaves are 30640 mm long. Each leaf is made up of 10625 pairs of very small (366 mm) leaflets along its length. A pair of stout spines, 10650 mm long, grows at the base of each group of leaves in young stems. Fluffy round clusters of golden yellow flowers, 10 mm in diameter with 20 mm stems, occur in groups of 266 at the leaf base. The seed pods are grey-green, covered in fine hairs and generally 1006200 mm long. The characteristic constrictions between each seed in the seed pod are reminiscent of a strand of pearls. The deep taproot also has several branches near the surface.

It is a serious rangeland weed and is one of the Twenty Weeds of National Significance identified under the National Weed Strategy. It is Declared P1 and P2 under the *Agriculture and Related Resources Protection Act 1976* and therefore infestations in Western Australia must be eradicated.

PAST MANAGEMENT OF THE NULLA-NULLA INFESTATION (PRE 2010)

A working group was formed for the management of the Nulla-Nulla infestation. The committee consisted of representatives of the Traditional Owners of the land, the Nulla-Nulla community, the resource agency for the community, Joorook Ngarni, Department of Indigenous Affairs (DIA), as the land is Aboriginal lands trust land, Department of Environment and Conservation (DEC) and the Department of Agriculture and Food (DAFWA). An initial management plan was worked out within the group.

Control work commenced in the 2004 dry season with Traditional Owners carrying out the work after training in chemical handling and chemical control techniques. Funding for this control work was from CDEP and additional funds were obtained from the National Prickle Bush Management Group (\$20,000). The chemical and diesel for the control work was funded by the Kimberley Zone Control Authority (ZCA). Supervision of the work was

carried out by DAFWA staff. This allowed control to be undertaken on plants on one of the dense infestations.

In 2005 there was no control work carried out due to lack of funds, however in 2006 control work was carried out on most of the infestation. There had been a fire through some of the infestation making the control of these plants less successful due to the stress that the plants were under. The control work was coordinated and supervised by the DAFWA staff. Some of the work was been carried out by Traditional Owners using CDEP funds and \$50,000 from DIA. Chemical and diesel for this work was purchased using funds from the Kimberley ZCA. Further funding had been obtained from the DEC from their Biodiversity and Conservation Initiative Funds (\$160,000 for the 06/07 financial year) and the national Prickle Bush Management Group (\$36,000) for the 06/07 financial year). These funds have allowed the employment of a weed control contractor to work on the rest of the infestation where the traditional owners were not carrying out work. A good control program occurred during the 2006 dry season and there was a follow up program using a contractor after the wet season in 2007.

Further funding for the control of this infestation was obtained for the 07/08 financial year from the Rangelands NRM funds. This funding allowed for further control work to be carried out by a contractor on the infestation in the 2007 dry season and in early 2008 after the wet season on new germinations or plants that were not killed in the initial control.

Regardless of this infestation being very high priority nationally securing ongoing funding has been a continuing problem with most funding areas not being long term. This has made it very hard to put in place any long term management plans for the area.

CURRENT MANAGEMENT OF THE NULLA-NULLA INFESTATION

The eradication of prickly acacia will require a long term approach with treatment to control existing plants, feral cattle control to prevent seed spread, and repeated inspection of the infested area to ensure that the seed bank is depleted and new germinations are destroyed.

The long term cooperation of the Traditional Owners and a commitment to assisting with the financial and physical resources from the Kimberly ZCA, with assistance from DAFWA, will be essential if this weed is to be eradicated.

Additionally Ord Land and Water (OLW) has secured funding for three years control and surveillance work through Rangelands WA and Caring For Our Country.

This management plan:

- Details the management options available for the location,
- Identifies the most suitable management options,
- Recommends an eradication program based on integrated pest management.

Operational resources

- Herbicide
- Application equipment
- Aerial surveillance ó helicopter

Human resources

- Initial inspection by OLW, DAFWA staff and Ranger Groups at key periods.
- Surveillance of high risk areas such as creek-lines, river systems and semi permanent / permanent water in adjacent areas (~15 km).
- Frequent treatment by contractors and/or staff (frequency to be determined).
- Yearly audit by DAFWA.

Management options for prevention of spread

Seeds of prickly acacia may be spread by:

- Water, through floods and along watercourses
- Animals, particularly feral cattle
- Humans through clothing or vehicle / machinery movement.

Plants have been found on both sides of the Durack River, Bulla Nulla Creek and on adjacent floodplains leading to the Cambridge Gulf. Wet season flood events are the main vehicles for seed spread beyond the site. Controlling mature plants within the flood inundation zones prior to seeding events is the only practical method of reducing the risk of seed spread from the site.

No fencing exists on the site and adjacent land however the Durack River and Cambridge Gulf both tend to act as a physical barrier to restrict some stock movement. A culling program for the feral cattle on the site is being proposed through DAFWA but still requires sign off from Traditional Owners.

Due to the extreme isolation of the area human and machinery movement is limited therefore signage and other strategies to restrict vehicle movement is probably not required at this location.

Surveillance

Aerial survey using a helicopter should be conducted in areas up and downstream of the infestation and that may have been covered with flood waters in the past twenty years. Surveillance technique recommended is 500m grids at approximately 200 feet and around 100km/hr. If trying to survey through thick canopy the grids may be reduced.

Suggested areas for aerial survey to be conducted include all known waterholes and water courses where water lays for much of the year downstream. A ground survey would be useful but not practical due to the lack of access to the area.

Seed bank control

Exhaustion of the seed bank is essential in order to achieve eradication. The aim is to stimulate as much residual seed as possible to germinate in the early years of control, without letting any seedlings reach maturity. Soil disturbance such as harrowing would not be suitable due to the lack of access. Fire was considered but has not proven to be an effective means to germinate seeds in other control areas. Killing the mature trees to stimulate seed germination appears to be the best method in this case.

Monitoring must be continued at the infestation site longer than the known seed longevity of seven years to ensure that the seed bank is exhausted, and that no further germinations occur.

Non-chemical control

The following control options have been considered for this size infestation and location. Not all are suitable, as indicated below.

- Mechanical clearing ó Not suitable in this situation
- Fire ó suitable for seedlings in limited applications only, considered not to be suitable in this situation.
- Cultural controls ó Not suitable in this situation
- Biological control ó Not suitable in this situation

Chemical control

In this situation the use of herbicides would provide the most effective control of the existing plants. The plants need to be growing actively to absorb herbicide. Aerial spraying is not suitable in this situation but the aerial application by hand of the granular herbicide Tebuthiuron by helicopter should be trialed. Ground application of liquid and granular herbicides is suitable and recommended, as follows:

Chemical	Rate	Comments
Fluroxypyr 200gm/L	300ml/100L	Foliar application when actively growing, apply to run off, use wetting agent.
Fluroxypyr 200gm/L	1:60 diesel	Basal bark or cut stump
Glyphosate 450g/L	Neat	Cut stump application
Hexazinone	50kg/ha or 5g/m ²	Seedlings and small infestations away from sensitive areas. Residual ó non selective herbicide
Tebuthiuron	10kg/ha or 1m/m ²	Apply after the onset of early season storms to freshen re-growth, moisten soil and close cracks. Repeated application may be required but prior to the onset of flooding.

The Recommended initial treatments for the Nulla-Nulla infestation are

- Basal bark application Fluroxypyr 200gm/L mixed at 1:60 with diesel.
- Hand application of Tebuthiuron at 10kg/ha or 1m/m² to the base of the tree just on or just after the onset of early season storms, soil type dependant. Herbicide should be either applied to the surface of moist soil or buried.

Monitoring and reporting

Two aspects of the plant's biology must be taken into account when monitoring the site after eradication treatments have been applied, namely the length of time from germination to seed production, and seed longevity.

Seeds germinate after the onset of the wet season and plants will grow rapidly with flowering and seed set within two to three years under ideal conditions. Flowering, seed production and pod drop occurs during the dry. Trees growing close to water courses tend to produce high numbers of seeds.

Seed longevity appears to vary with soil type, but in general the seeds may remain viable in the soil for up to seven years. Most however germinate or are destroyed within two years.

Overall, monitoring should be repeated every 6 months to prevent new seedlings producing ripe seeds, and continued for at least 10 years.

Outline of Management Actions

Year	Action	Timing	Who to do	Comments
Prior to wet season 2010/2011	Surveillance	Before wet season	OLW, DAFWA	Infested area and buffer area surrounding to be surveyed to ascertain full extent of the spread including the plants found on the Pentecost River.
	Application of soil herbicide	Before wet season	OLW, DAFWA	Hand application of Tebuthiuron to the base of the tree, initial applications carried out in the dry to be buried to ensure future efficacy. Trial applications to be done once early season storms are around, chemical to be applied out of a helicopter onto wet soil.
End of wet season 2010/2011	Surveillance	April /May 2011	OLW, DAFWA	Check for efficacy of hand application from helicopter, re-growth and new seedlings through visual inspection of site.
Dry season 2011	Treat re-growth and seedlings	July/September 2011	OLW, DAFWA, Ranger Group?	Basal bark application as required
	Application of soil herbicide	Before wet season	OLW, DAFWA	Hand application of Tebuthiuron as required, application dependant on previous wet season results.
	Cattle control	Dry season	DAFWA	Culling of feral cattle to reduce spread of seed.
	Surveillance	Dry season	OLW, DAFWA, Ranger Group?	Visual inspection of site.
End of wet season 11/12	Surveillance	April /May 2012	OLW, DAFWA	Visual inspection of site.
Dry season 2012	Treat re-growth and seedlings	July/September 2012	OLW, DAFWA, Ranger Group?	Basal bark application as required
	Application of soil herbicide	Before wet season	OLW, DAFWA	Hand application of Tebuthiuron as required.

	Cattle control	Dry season	DAFWA	Culling of feral cattle to reduce spread of seed.
	Surveillance	Dry season	OLW, DAFWA, Ranger Group?	Visual inspection of site.
End of wet season 12/13	Surveillance	April /May 2012	OLW, DAFWA	Visual inspection of site.
Dry season 2013	Treat re-growth and seedlings	July/September 2012	OLW, DAFWA, Ranger Group?	Basal bark application as required
	Application of soil herbicide	Before wet season	OLW, DAFWA	Hand application of Tebuthiuron as required.
	Surveillance	Dry season	OLW, DAFWA, Ranger Group?	Visual inspection of site.