

Mimosa pigra at Peter Faust Dam, Proserpine, Queensland, Australia

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Abstract

A small mimosa, *Mimosa pigra* L., infestation has been found at Peter Faust Dam, located approximately 25 km west of Proserpine in Queensland. Peter Faust Dam is at the head of the Proserpine Catchment system and is utilised as a recreational and water storage area.

The initial infestation was identified in February 2001 and a control program was instigated immediately. Three detailed survey/control programs have occurred since, in September 2001, April 2002, and September 2002. Surveys during April 2002 identified substantial mimosa germination within the south-western areas of the dam. Infestations existed between current high- and low-watermarks, generally dispersed in thick *Melaleuca*. Mechanical control was undertaken in this area of the dam by the removal of high priority *Melaleuca*/mimosa areas and the construction of access tracks along the foreshore. New germination was largely a result of receding water levels within the catchment. The dam water levels are predicted to drop further and it is expected future germination will occur.

September 2002 saw the initial control zone extended to approximately double its original size. Further access tracks and high priority areas within the control zone were bulldozed to eliminate *Melaleuca* stands currently hindering access and vision. Future plans include undertaking controlled burns and follow-up in these areas.

To date, all known plants have or are being controlled. Plans include undertaking controlled burns and follow-up in these areas. A key stakeholder group has been formed, an extension and communication strategy is being developed and alternative high-risk areas of the State are being surveyed.

Keywords: mimosa, surveys, control program, Queensland.

Introduction

A native of tropical America, mimosa, *Mimosa pigra* L., has spread to a number of tropical countries throughout the world, including Australia. It is believed that its introduction into Australia was around the 1870s, either accidentally in seed samples or as an ornamental, at the Darwin Botanical Gardens (Miller and Lonsdale 1987). By the

1980s mimosa had spread significantly, with monospecific stands occurring over large areas of the Adelaide River floodplains. Today, over 80,000 hectares of native vegetation has been replaced by mimosa in the Northern Territory, from the Adelaide River area, to Deep Water, and to the Finnis, Margaret, Reynolds, Mary, Daly, South and East Alligator Rivers. Some colonies are also found in Kakadu National Park.

In February 2001, the first infestation outside of the Northern Territory was confirmed at Peter Faust Dam, Proserpine. Peter Faust Dam is located approximately 25 km west of Proserpine, Queensland, latitude 20°24'4"S, longitude 148°34'50"E.

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The dam is located in the headwaters of the Proserpine Catchment and is utilised for both water storage and recreational activities. At full water supply, the dam's perimeter is 74 km.

The dam's topography is broken and undulating, with *Melaleuca leucadendra* (L.) L., *Melaleuca quinquenervia* (Cav.) S.T. Blake, and *Melaleuca viridiflora* Sol. ex Gaertner, being the dominant vegetation. Thick stands of these plants occur to full supply level around the majority of the dam, making access for mimosa control difficult.

Mimosa is a leguminous prickly shrub growing to a height of five metres. A typical stand of mimosa comprises one plant per square metre and produces 9,000 seeds per square metre of canopy. Isolated plants cover larger areas and can produce up to 220,000 seeds per year (Lonsdale 1992). Leaves are bi-pinnate, prickly and are sensitive to light and touch. Stems are hairy, with recurved thorns, and generally have aerial roots at the base. Pink, ball-shaped inflorescences occur in leaf axils. In hot, moist conditions, plants can flower all year. The brown, hairy pod of mimosa breaks into single-seeded segments which, when shed, leave a safety pin shaped skeleton formed by the pod structure. Seed segments are covered with stiff bristles, which allow them to float and be spread by water. Between catchments, spread occurs via human activity, and by feral, domestic, and native animal movement.

Mimosa causes economic, environmental and social issues including the following:

- reduction of national and international significant wetland area
- rare and vulnerable plant and animal species being threatened

- reduction of suitable habitat for native fauna
- reduction in grazing and water resource country
- increased difficulties in stock management, infrastructure and feral animal control
- negative tourism effects via decreases in the scenic value of wetlands and reduction of accessible areas from recreational activities
- economic costs associated with control and containment.

Control efforts

In February 2001, the leaseholder of Peter Faust Dam reported an unfamiliar prickly bush, which was confirmed as mimosa by the Queensland Herbarium. An immediate small-scale inspection of the south-eastern edge of the dam (where the initial plant was discovered) revealed approximately 100 plants on the current high water mark. A control project was initiated immediately consisting of 13 men including the landowner, Sunwater (the asset owner), the Whitsunday Shire Council and the Department of Natural Resources and Mines. Equipped with four boats and several four-wheel drive vehicles, the crew engaged in both ground and water surveys around the entire perimeter of the dam to identify, map and control any mimosa present. Due to the terrain and *Melaleuca* vegetation vehicle access was very limited around the dam, the majority of the survey consisted of men walking in shallow water and up to a minimum distance of 15 m above the highest known water level (Figure 1).

If encountered, mimosa was mapped via a GPS, the area flagged with tape and the relevant details



Figure 1. Surveys for mimosa on Peter Faust Dam.

recorded. Any seeds were removed from the plant on site and were bagged and tied. Only after seed removal was the plant physically removed and placed in the boat. All plants were returned to a bunded area close to the dam and incinerated. Seed bags were also incinerated. The bunded area will continue to be monitored regularly for mimosa growth. Approximately 800 to 1,000 plants were found on the south-eastern and south-western areas of the dam, with the majority being under 1.5 m high.

Two small mature infestations were discovered within the south-western area of the dam in five metres of water. The main infestation was approximately 30 × 30 m and the smaller 3 × 3 m; both sites were 85–90% under water cover. Approximately two metres of foliage was visible above the water level. All plants found within the main infestations were physically removed to a minimum depth of half a metre, after seed removal. A floating bund was utilised to assist in the collection of any seeds that may have been overlooked. Destruction of such material was carried out as for the ground plant methodology.

A helicopter survey was undertaken within the dam and surrounding Proserpine catchment. No additional infestations were discovered. The initial survey required 13 men for a 10-day duration. A follow-up survey was undertaken in September 2001. The methodology was similar to the initial survey, but refined slightly with three

crews of three men, each equipped with a flat-bottom boat surveying (via ground and water) and controlling the entire perimeter of the dam. Approximately 150 plants were found in similar locations to the initial survey, the majority being only one to two centimetres in height. Both main infestations had died. This survey utilised nine men for six days.

A Peter Faust Dam Mimosa Management Group comprising all major stakeholders was then developed. The group goals were to develop a management plan for the dam over the next five years. Stakeholders agreed upon bi-annual surveys in February and September as the basis of the plan.

In April 2002 a control program was initiated utilising 10 men, consisting of the major stakeholders. Surveys of the dam found mimosa germination extensive within the south-western area of the dam. Mimosa was germinating both in the receding water level zone and within the thick *Melaleuca* band, which occurs at full supply level. Current water levels were at 63% and were expected to drop further to 45%. Infestations could no longer practically be physically removed, with the *Melaleuca* presenting access and visual concerns.

Researchers from Alan Fletcher Research Station, Brisbane, Queensland, undertook work at the site to determine the mimosa density and soil seed-bank levels.



Figure 2. Access tracks developed and *Melaleuca* and mimosa bulldozed and piled ready for burning.



Figure 3. Main mimosa infestation site.

Within areas of heavy infestation mimosa was recorded at a level of up to 400 plants per 25 m². The management group re-evaluated control options and a decision was made to clear an access track just off the foreshore within the south-western area. Additional *Melaleuca* zones with thick mimosa present were bulldozed and piled. Approximately 17 km of track was bulldozed, taking 32 days. All mimosa was chemically treated with metsulfuron-methyl (Brush-off®) at 15 g/100L. Within the control zone, all foreshores were blanket sprayed. The project ran for five weeks and used a total of 6.7 kg of Brush-off and 30 L of wetter.

Wash-down sites were established and guidelines developed to minimise the risk of vehicles and other machinery moving seed off site.

The management team re-evaluated the control project plan and major outcomes were as follows.

- undertake monthly inspections of the south-western control zone and do random checks of the remaining perimeter
- undertake three annual surveys of the entire dam perimeter in september, February and May
- develop an extension support program for the dam and state
- undertake feral pig control regularly
- landholder to hold cattle for at least five days prior to movement off site
- extend the cleared control zone to all high priority mimosa areas on the south-western area of the dam. this control is to be undertaken both within the foreshore area and all thick melaleuca areas where mimosa has been controlled in past campaigns
- utilise fire management where appropriate.

The September 2002 control project utilised 12 staff over 12 days. The entire perimeter was surveyed and controlled in addition to all tribu-

aries leading into and from the dam. Only two mature seeding plants were identified; the majority of plants were scattered and below knee height.

To date, the extended control zone has been completed. The *Melaleuca* has been cleared by bulldozer and chain in thicker areas and cleared by blade plough along the foreshore. The chained area has been divided into cells with firebreaks established, with burns planned when conditions permit. Any fallen timber remaining after burnings will be stacked and re-burnt. This control will not only assist in mimosa control but also, more importantly, control *Melaleuca*, which is currently providing access and visual difficulties.

Future plans should incorporate efficient and effective mimosa control in addition to *Melaleuca* regrowth control within high priority control zone areas. Researchers are currently undertaking seed-bank counts within high priority zones to assist in future management planning.

Acknowledgements

The author would like to thank all major stakeholders including; Sunwater, Charlie Faust, the Whitsunday Shire Council, the Department of Natural Resources and Mines, Research, Strategic Weed Eradication Education Program and Land Protection staff, for their financial assistance and/or resources during the project to date.

References

- Lonsdale, W.M. 1992. The biology of *Mimosa pigra*. In: ed. Harley, K.L.S., A Guide to the Management of *Mimosa pigra*, CSIRO Canberra, pp 8-33.
- Miller, I.L. and Lonsdale, W.M. 1987. Early records of *Mimosa pigra* in the Northern Territory. *Plant Protection Quarterly* Vol 2(3): 140-142.