

Weed Management Plan for Mimosa (*Mimosa pigra*)

2013



Weed Management Branch

Department of Land Resource Management
PO Box 496
Palmerston NT 0831

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Cover photo: Mimosa flower.

Executive summary

This Weed Management Plan forms part of a strategic approach to mimosa (*Mimosa pigra*) management in the NT, with the overall aim being to mitigate the damage caused by mimosa in relation to the natural environment, the Territory economy and social and cultural land uses.

A comprehensive weed risk management assessment found mimosa to be a very high risk weed where potential exists for successful management. On the basis of this assessment mimosa has retained its declaration status under the *Weeds Management Act* (the Act) as:

Class A: to be eradicated (all areas of the NT except where it is classified as Class B);

Class B: growth and spread to be controlled This is an area roughly described as west of the Kakadu National Park, north of Adelaide River township, north-west of the Daly River/Port Keats road and north-east of the Moyle River and an area of the Oenpelli floodplain.

Class C: prevent introduction into the NT (All Class A and B areas are also classified as Class C).

The mixed declaration classes (A/C and B/C) reflect the varying feasibility of control between the two areas. Low density, high feasibility of eradication and control (Class A), and high density, lower feasibility of eradication or control (Class B), plus the need to prevent new introductions across all of the Territory (Class C).

The delineation of management zones associated with these declaration classes represents a defensible balance between the difficulty of managing large established infestations (B/C zone) and the urgent need to eradicate outlying populations (A/C zone).

This plan establishes the objectives, management requirements and management actions and outcomes to be achieved by land managers and the minimum actions to be taken to achieve these outcomes. Conducting land management practices in accordance with this plan will secure compliance with the requirements of the Act. As this is the first plan to be prepared for mimosa, the outcomes and options identified represent a first step towards reducing the impacts and threats of this weed. It is acknowledged that the range of capabilities for managing weeds vary between land managers and that in the first instance some will need time to build knowledge and capacity to adjust to new requirements. Accordingly this plan takes effect for a period of three years, during which it will be monitored. The plan will be reviewed and any necessary adjustments made at the end of that period.

This plan also incorporates *best management practice goals* which will ultimately contribute to strategic weed control at a Territory scale. Information on a range of management techniques and control methods, including physical and chemical control, controlled burning and hygiene procedures is included.

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1. Introduction

1.1 Background

Mimosa (*Mimosa pigra*) is a thorny shrub native to Central and South America. Mimosa was introduced to the Northern Territory (NT) in the late 1800's to the Darwin Botanic Gardens; it was considered interesting because of the way its sensitive leaves respond to touch. By the late 1960's mimosa was observed to be spreading in areas within the Adelaide, Finnis, Daly, Mary and East Alligator River catchments. Mimosa has now spread across 15 catchments and onto three islands (the Perrons, Melville Island and Croker Island) in the Top End.

Mimosa has proven to be particularly invasive on floodplains, where it can form vast monocultures. It has significantly impacted wetland ecosystems, affected grazing production and restricted social and cultural land use. Mimosa has been declared a Weed of National Significance (WoNS) due to its invasiveness, potential for spread, and economic and environmental impacts.

1.2 Period and application of plan

This plan, being the *Weed Management Plan for Mimosa (Mimosa pigra)*, has been developed in accordance with section 10 of the *Weeds Management Act* (the Act) and applies to the whole of the NT. It specifies the minimum requirements for managing mimosa in the NT. It applies to all landholders, including the Northern Territory Government.

This plan takes effect from 24th day of December 2013. It must be reviewed within three years of this date and will cease ten years from this date, unless replaced by a revised plan.

During the first three years of this plan, the NT Government will monitor the effectiveness of the plan to determine the most appropriate management obligations of landholders for future planning and control. In the meantime, the requirements specified should be observed by all landholders.

Meeting the objectives set out in this plan is important for long term effective management of mimosa in the NT. Landholders are required to meet the management requirements outlined in the plan in order to secure compliance with the Act. Penalties of between 77 and 770 penalty units (\$10 857 and \$108 570) for individuals and between 385 and 3850 penalty units (\$54 285 and \$542 850) for a body corporate apply for failure to comply with this plan*.

* Penalty units are determined by the *Penalty Units Act*. As at 22 May 2012 the Penalty Units Regulations prescribed the monetary value of a penalty unit as \$141.

1.3 Coordinated and adaptive management of mimosa

As mimosa has now spread so extensively across multiple catchments, land tenures and properties in the Top End, it is imperative that land owners work together to coordinate a systematic management approach across catchments to contain the spread. This Weed Management Plan has been developed with extensive stakeholder consultation. It aims to address the concerns of all stakeholders by providing strategic management directives which are intended to mitigate the economic and environmental risks posed by mimosa.

The Department of Land Resource Management (DLRM) will work closely with stakeholders, including other government departments, to implement and monitor the performance of the plan. Continued improvement will be made possible through a commitment to regularly review the plan and make changes where necessary. In particular, it is recognised that the initial three year period of implementation will be extremely important with respect to

informing and supporting landholders and managers and gauging the costs and effectiveness of actions taken pursuant to the plan. Feedback will be sought from landholders executing their own control plans; a process which will be greatly assisted by maintaining good records of management actions undertaken and the results of those actions.

2. Aim and objectives

2.1 Aim

To limit the impact of mimosa on the natural environment, the NT economy and social and cultural land uses by:

- providing clear and measurable management actions and targets (refer section 5 and Appendices A, B and D);
- defining the management requirements applicable to all land users in the NT, which form an integral part of the strategic management of mimosa across the Territory; and
- providing recommendations and information on actions required to meet management obligations.

2.2 Objectives

1. To eradicate existing infestations and prevent further establishment of mimosa in the A/C zone by:

- a) eradicating isolated plants and outbreaks;
- b) implementing early detection and eradication programs; and
- c) designing and implementing a weed spread prevention program.

2. To control the growth and spread of mimosa in the B/C zone by:

- a) eradicating isolated plants and outbreaks;
- b) implementing early detection and management programs outside major infestations;
- c) active containment of major infestations;
- d) preventing/minimising further seed production; and
- e) designing and implementing a weed spread prevention program.

3. To apply an adaptive approach to weed management by:

- a) developing and implementing nationally consistent and targeted extension products and activities (refer section 9);
- b) developing and maintaining an ongoing monitoring program;
- c) maintaining accurate records of control methods applied and results achieved for possible collation at a Territory level; and
- d) evaluating the efficiency of control and containment programs over time.

2.3 Targets

Mimosa management is an ongoing process. This plan outlines a number of targets to assist all land users to measure the effectiveness of the management objectives over the life of the plan (refer Appendix D).

3. Mimosa declaration status

3.1 Declaration status

Mimosa is declared under section 7 of the Act as:

- **Class A (to be eradicated)** in all areas of the NT except where it is classified as Class B;
- **Class B (growth and spread to be controlled)** inside that area starting at the Wildman River mouth, then moving in a southerly direction along the western boundary of Kakadu National Park until this meets the Mary River, moving across the Mary River in a westerly direction along the northern boundary of NT Portion 695, then moving in a southerly direction along the western boundary of NT Portion 695, then moving in a southerly direction until the boundary of NT Portion 5083, then moving in a north westerly direction along NT Portions 5786, 198, 209, 198 until this meets Coach Road, then following Coach Road until it meets the intersection of NT Portion 4036 and 795, then travelling in a westerly direction along the boundary of Litchfield National Park until it joins the north eastern extremity of NTP 3220, then moving in a southerly direction until the south eastern extremity of NT Portion 6220, moving in a southerly direction until the Daly River Road, then moving in a south westerly direction across the Daly River, then moving in a west south west direction until the north eastern bank of Tom Turner Creek, then moving in a north west direction until the junction of the Moyle River, then moving in a west north west direction until the mouth of the Moyle River, then along a line following the coast in a generally north and east direction, closing at the Wildman River mouth; and inside that rectangular area contained within the 'Oenpelli floodplain' of parcel NTP 1646 that is described as starting at latitude (lat.) -12.1584 longitude (long.) 132.9200 (north west corner), moving easterly to lat. -12.1584, long. 133.0330 (north east corner), then moving southerly to lat. -12.2650, long. 133.0330 (south east corner), then moving westerly to lat. -12.2650, long. 132.9200 (south west corner), then moving northerly to re-join lat. -12.1584 long. 132.9200 (north west corner).
- **Class C (not to be introduced to the NT)** (all class A and B areas are also classified as Class C).

The boundaries of the Class A/C and Class B/C zones are shown in Figure 1.

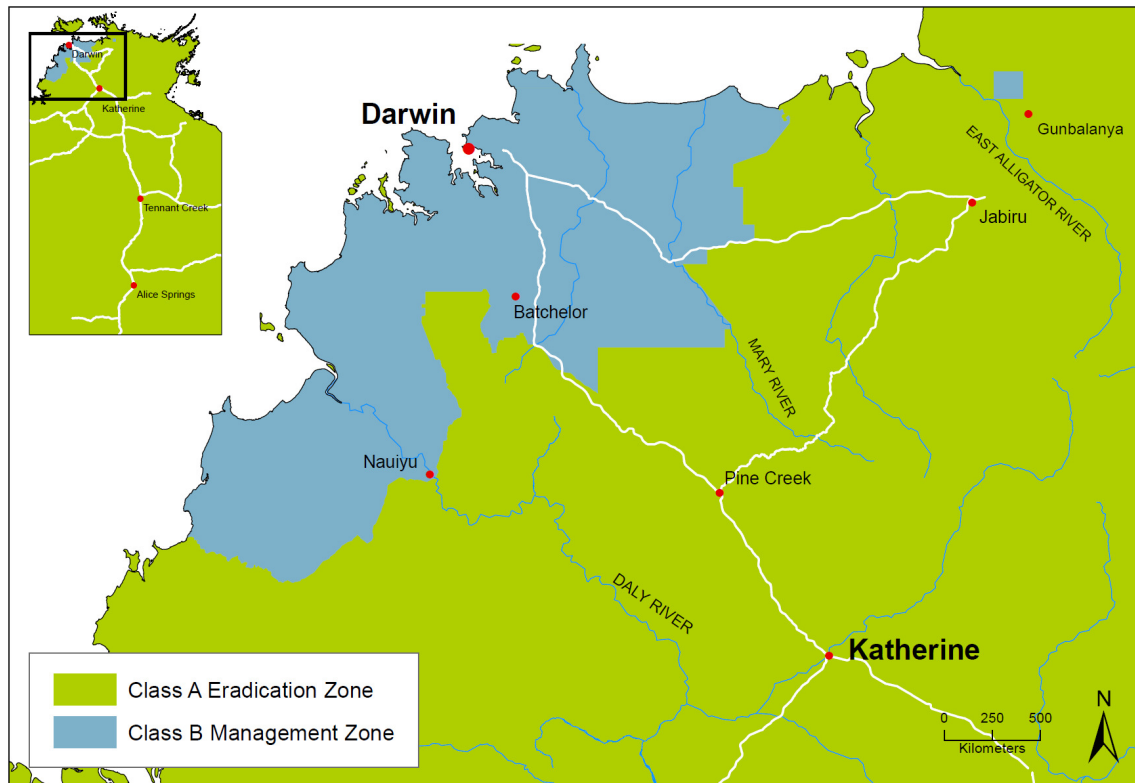


Figure 1: Mimosa declared management zones, showing eradication (Class A/C) and growth and spread to be controlled (Class B/C).

3.2 Northern Territory Weed Risk Management System

The Territory Government uses the NT Weed Risk Management System to identify and prioritise plants to be considered for declaration as weeds in accordance with the Act and to determine the appropriate management requirements for those plants. The declaration is consistent with the results of the risk assessment undertaken for mimosa.

The Class A/C zone has been identified as having a lower number of mimosa infestations. Eradication is considered technically and economically feasible. The Class B/C zone contains a high number of large and dense infestations. Eradication in this area would be prohibitively expensive and unlikely to be achieved. The aim is therefore to contain existing infestations, while eradicating any smaller and/or new infestations within the zone.

For management to be effective in the Class A and B zones, the restriction of spread must be prioritised. The whole of the NT is classified as Class C, so therefore no mimosa is to be introduced into any area within the NT.

For further information on the Weed Risk Management System or how it specifically applies to mimosa please refer to the NT Weed Risk Management System Fact Sheet or the *NT Weed Risk Assessment Report: Mimosa pigra (Mimosa)* available at www.nt.gov.au/weeds.

4. Current distribution

In the NT mimosa occurs from the Victoria River in the west to the Phelp River in southeast of Arnhem Land. The largest infestations are within the Adelaide, Mary, Finniss, Daly and East Alligator River catchments. Smaller, less dense infestations also occur in the Victoria, Moyle, Fitzmaurice, Roper, Blyth, Liverpool and South Alligator catchment systems and in the upper parts of the Daly, Finniss, Adelaide and Mary River systems. These infestations are particularly important as they represent areas where further spread and establishment into un-infested areas is likely (Figure 2).

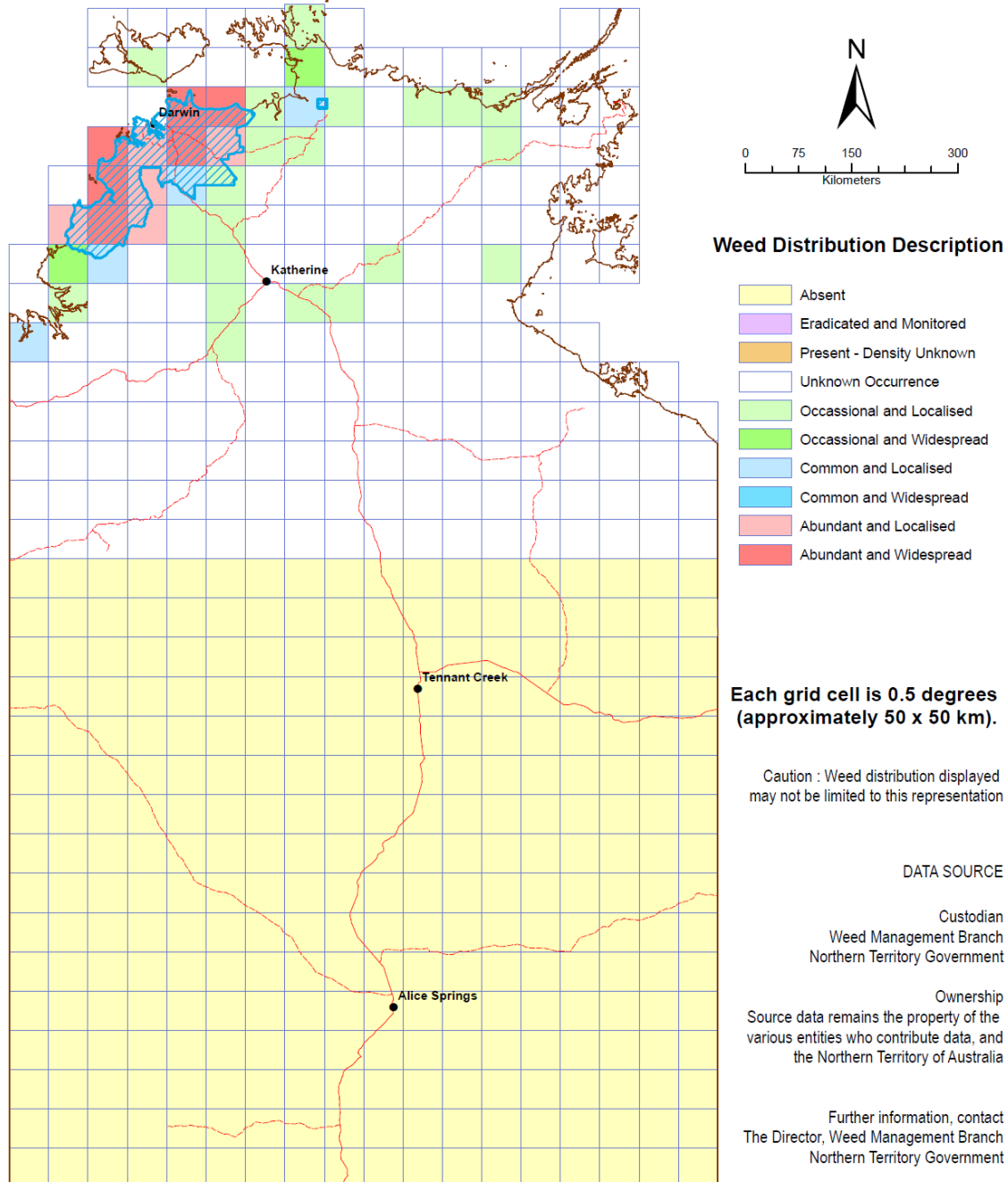


Figure 2: Distribution of mimosa in the NT, showing areas (blue hatching) declared as Class B/C zone (Weed Management Branch 2013).

5. Management requirements

5.1 Introduction

Successful weed management may require significant investment over an extended period of time. In particular, the control of large, established infestations will require careful planning, prioritisation and budgeting. Results may not be immediately apparent: it may require repeated effort to produce obvious reductions in distribution and density.

The actions detailed below have been identified as the minimum acceptable requirements needed to achieve the objectives sought and compliance with each declaration class. Landholders may choose to implement a higher level of management than is required by this plan e.g. a landholder within the B/C zone may seek to eradicate, rather than contain, a large population of mimosa. Similarly it would be reasonable to assume that mimosa should be eradicated from all urban settings despite major centres falling within the B/C zone.

A summary of management obligations and related actions for the A/C and B/C zones are provided at Appendices A and B.

5.2 Eradication (Class A)

Land managers and users in the A/C zone are required to identify and eradicate all mimosa infestations and prevent new infestations. To achieve this, the following must be undertaken:

1. Inspect the property (including any previously treated areas) to identify and record the location of mimosa plants/infestations. It is recommended that:
 - a. inspections are undertaken at least annually before wet season rains start to allow for any necessary control work to be organised and undertaken early in the wet season; and
 - b. previously treated areas, creek lines and floodplain areas are more regularly and thoroughly monitored to avoid re-establishment and/or spread.
2. Develop and implement an eradication program to kill isolated plants and outbreaks and prevent the spread of mimosa within or from the property. Control must occur prior to seed production and dispersal (refer section 6). The following should be taken into consideration:
 - a. optimum treatment results will be achieved when mimosa plants are actively growing (early wet season after first rains or early dry season when flood waters recede);
 - b. successful control prior to seed dispersal, will minimise future recruitment and associated control effort requirements (seed production generally starts in January but can vary - refer section 6.1.3);
 - c. target areas may become inaccessible due to flooding; and
 - d. there are no registered herbicides in the NT that can be used once mimosa plants are in standing water.
3. Avoid creating conditions which would promote mimosa germination and spread by implementing appropriate grazing regimes, managing feral animals and controlling erosion and fire where applicable.

4. Design and implement a weed spread prevention program that aims to ensure no new mimosa infestations establish as a result of seed dispersal (refer section 7).
5. Notify the Weed Management Branch of the presence of mimosa when it is identified in areas which it has not been found previously.
6. Monitor the results of mimosa management. In order to evaluate success and get the most out of your program, it is suggested that land managers keep a record of the methods used and management outcomes (refer Appendix C).

Please note that to significantly reduce the size of a major mimosa infestation it will take many years and as such, the capacity and resources needed to maintain the control program in the longer term should be considered from the onset.

5.3 Controlling growth and spread (Class B)

Land managers and land users in the B/C Zone are required to control the growth and spread of mimosa on and between properties. To achieve this, the following must be undertaken:

1. Inspect the property to identify and record the location of mimosa plants/infestations. It is recommended that:
 - a. inspections are undertaken at least annually before wet season rains start to allow for any necessary control work to be organised and undertaken early in the wet season; and
 - b. previously treated areas, creek lines and floodplain areas are more regularly and thoroughly monitored to avoid re-establishment and/or spread.
2. Develop and implement an eradication program to kill isolated plants and outbreaks and prevent the spread of mimosa within or from the property. Control must occur prior to seed production and dispersal (refer section 6). Containment areas should be accurately geo-referenced and documented to ensure the infestation does not gradually expand. The following should be taken into consideration:
 - a. optimum treatment results will be achieved when mimosa plants are actively growing (early wet season after first rains or early dry season when flood water recede);
 - b. successful control prior to seed production and dispersal will minimise future recruitment and associated control efforts (seed production generally starts in January but can vary - refer section 6.1.3);
 - c. target areas may become inaccessible due to flooding;
 - d. there are no registered herbicides in the NT that can be used once mimosa plants are in standing water; and
 - e. remnant plant material may need to be physically removed after initial treatments. Immediate revegetation or seeding with pasture will reduce chances of mimosa seedlings re-establishing from the seed bank.
3. To control the growth and spread of mimosa on and between properties, land holders must establish and maintain mimosa free buffer zones to contain major infestations (refer section 6).

4. Avoid creating conditions which would promote mimosa germination and spread by implementing appropriate grazing regimes, managing feral animals and controlling erosion and fire where applicable.
5. Design and implement a weed spread prevention program that aims to ensure no new mimosa infestations establish as a result of seed dispersal (refer section 7).
6. Land managers should actively release, establish, manage and monitor biological control agents in major mimosa infestations.
7. Monitor the results of mimosa management. In order to evaluate success and get the most out of your program, it is recommended that you keep a record of the methods used and management outcomes which is consistent with the example provided at Appendix C.

Please note that to significantly reduce the size of a major infestation it will take many years and as such, the capacity and resources needed to maintain the control program in the longer term should be considered from the onset.

5.4 Preventing introduction (Class C)

This zone includes all of the Territory. All land users must ensure there is no further introduction of mimosa into the NT or into areas which are not currently infested.

1. If you have mimosa on your property you must design and implement a weed spread prevention program, which will ensure that no new mimosa infestations establish as a result of seed transfer or spread.

6. Eradication and control methods

6.1 General

Effective mimosa management is dependent on the application of an integrated natural resource management approach. Weed control will be more successful where land managers are also implementing appropriate grazing regimes, managing feral animals and controlling erosion and fire on their properties. It is recognised that, in some instances, successful weed management outcomes may not be immediately evident due to the complexities associated with integrated natural resource management and level of investment requirement. Spread prevention remains the most successful and cost effective way of managing weeds.

6.1.1 Integrated weed control

Integrated weed control involves using a combination of control techniques to achieve more effective, longer term weed management outcomes. In the case of mimosa, integrated control may include the use of fire, the application of grazing land management techniques, physical control, chemical control and biological control.

6.1.2 Property weed management planning and mapping

It is recommended that all land holders that have declared or problematic weeds on their land develop a property weed plan, which includes a detailed assessment of all infestations on the property. The assessment will enable consideration of the weeds' current distribution, the potential for spread (along water courses, access tracks/roads, animal movement, etc.) and potential impacts on land use and other values such as biodiversity. Once this information is collated, priority control areas and suitable control methods can be identified.

A property weed plan should detail exactly what needs to occur in order to meet or exceed all requirements of this statutory weed management plan, and any other weed management requirements which may be applicable to a certain property.

The Weed Management Branch has produced Guidelines for Weed Data Collection in the Northern Territory. These, more technical, guidelines describe what information to collect when mapping, controlling and monitoring weed infestations in the NT. The supply of weed data to the Weed Management Branch, in accordance with these guidelines, will contribute to the collection of accurate data fundamental to planning and delivering strategic and coordinated weed management across the NT. The guidelines can be downloaded at <http://www.nt.gov.au/weeds>.

6.1.3 Timing weed control

The growth and reproductive cycles of a weed species must be taken into account when developing a weed plan for your property. Implementing control measures at the wrong time of year can significantly reduce both the short and long-term success of management actions. Table 1 provides an overview of mimosa growth and reproduction and identifies corresponding optimal treatment times for different control options. It should be noted that peak growth, flowering and seeding times can vary due to seasonal variations and as a result of previous control activities.

Table 1: Guide to the management of mimosa

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering	Striped	Striped	Striped	White	White	White	White	White	White	Striped	Striped	Striped
Pod formation	Striped	Striped	Striped	Striped	White	White	White	White	White	White	White	White
Seed drop	White	White	Striped	Striped	Striped	Striped	Striped	White	White	White	White	White
Germination	White	White	White	Striped	Striped	Striped	Striped	White	White	Striped	Striped	Striped
Aerial	White	White	White	White	White	White	White	White	White	White	Black	Black
Soil applied herbicides	White	White	White	White	White	White	White	White	Black	Black	Black	White
Foliar spraying	White	White	Black	Black	Black	Black	White	White	White	White	Black	Black
Basal bark	Black	Black	White	White	White	White	White	White	White	White	White	White
Cut stump	Black	Black	White	White	White	White	White	White	White	White	White	White
Physical removal	White	White	Black	Black	Black	White	White	White	White	White	White	White
Burning of chained areas	White	White	White	Black	Black	Black	White	White	White	White	White	White

Striped cells (≡) General growth pattern
 Grey cells (■) Growth patterns in wet years
 Black cells (■) Months that are suitable for control option specified
 White cells (□) Months that are unsuitable for control option specified

6.2 Chemical control

Herbicide application is an effective means of mimosa control, however it is likely that follow-up control, potentially over a number of years, will be required. The type of herbicide and method of application chosen will depend upon the location and size of the infestation, environmental factors, available resources and the integration of other control methods.

Herbicide is most effective when applied to an actively growing plant. Ideally application should precede seed production. The period of active growth for mimosa can vary depending on location and water availability, but is generally during the early wet season to the early dry season (please refer to Table 1).

6.2.1 Disclaimers

In the Northern Territory, a registered product must only be used in situations consistent to those appearing on the label, unless authorised under a permit; and a person:

- must not have in their possession or use a chemical product unless the product is registered in Australia (exemptions apply);
- may use a registered product at a concentration, rate or frequency lower than that specified on the label unless this is specifically prohibited on the label – this does not apply to herbicide use occurring under an APVMA permit;
- may use a registered product to control a pest not specified on the label provided the pest is in a situation that is on the label and use on that pest is not specifically prohibited on the label; and

- may use a registered product using a method not specified on the label unless specifically prohibited on the label.

Users of agricultural (or veterinary) chemical products must always read the label and any permit before using the product, and must strictly comply with the directions on the label and any conditions of any permit. Users are not absolved from compliance with the directions on the label or conditions of the permit by reason of any statement made in or omitted from this publication.

Table 2: Herbicides suitable for use in the management of mimosa (NT)

Chemical & concentration	Rate	Situation, method & comments
Tebuthiuron Various trade names	1g/m ²	Seedling or adult (individuals or infestation) <ul style="list-style-type: none"> • Granulated herbicide - soil applied • Do not use within 30 m of desirable trees • Do not apply to a continuous area > 0.5 ha • Use higher rate on dense growth or heavy clay soils • Do not use if fire is imminent • Apply when there is soil moisture or prior to rain
	5 - 10 kg/ha	Seedling or adult (individuals or infestation) <ul style="list-style-type: none"> • Granulated herbicide - aerially applied • Apply after the onset of storms and prior to wet season surface flooding
Fluroxypyr 200 g/L Various trade names	300 ml/100 L	Seedling or adult (individuals or infestation) <ul style="list-style-type: none"> • Foliar application when actively growing • Wetting agent Uptake ® required – 500 ml/100 L
	3 L product with 60 L water/ha	Seedling or adult (infestations) <ul style="list-style-type: none"> • Aerial control
	1:60 (diesel)	Seedlings or adults <ul style="list-style-type: none"> • Basal bark or cut stump application method • Foliar application when actively growing
Fluroxypyr 333 g/L Starane® Advanced	180mL / 100 L	Seedling or adult (individuals or infestation) <ul style="list-style-type: none"> • Foliar application when actively growing • Wetting agent Uptake ® required – 500 ml/100 L
	1.8 L / 60 L water / ha	Seedling or adult (infestations) <ul style="list-style-type: none"> • Aerial control
Metsulfuron-methyl Various trade names	60 g product with 60 L water/ha	Seedling or adult (infestations) <ul style="list-style-type: none"> • Aerial control • Non-ionic surfactant required 100 ml/100 L
Dicamba Various trade names	Kamba 500 6L/Ha	Seedling or adult (infestations) <ul style="list-style-type: none"> • Aerial control • Use the wetting agent LI700®
	Kamba 500 400 ml/100L	Seedling or adult (individuals or infestation) <ul style="list-style-type: none"> • Foliar application when actively growing

Chemical & concentration	Rate	Situation, method & comments
Glyphosate Various trade names	ratio 1:1 of water	Seedling or adult (individuals or infestation) <ul style="list-style-type: none"> Cut stump
Hexazinone	50 kg/ha	Seedlings and adults (individuals and infestations) <ul style="list-style-type: none"> Not recommended for use over large continuous areas as non-selective residual herbicide

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product does not imply endorsement by DLRM over any other equivalent product from another manufacturer.

6.2.2 Aerial spraying

Aerial spraying is the most cost effective method for treating large and/or inaccessible mimosa infestations. To maximise management outcomes and financial investment, aerial spraying should be limited to areas of infestation which can be monitored and controlled for several years after treatment.

6.2.3 Soil applied herbicides

The effectiveness of soil applied (granulated) herbicides is dependent on soil type, available moisture and soil organic matter. These herbicides should only be applied when there is soil moisture present and prior to rain. Soil applied herbicides should not be used if fire is imminent. A higher rate of herbicide should be applied on dense growth or heavy clay soils.

6.2.4 Foliar spraying

Foliar spraying application methods will vary depending on available equipment and the size and height of the infestation. Blanket spraying, using a boom spray from a tractor or 4-wheel drive vehicle, can be used to treat large monocultures of seedlings. Large infestations that require targeted applications of herbicide may require the use of a handgun and mobile pump and tank i.e. on a quad bike or tractor. Spot spraying, using a backpack spray unit and handgun, will effectively treat individual plants or small infestations.

Foliar spraying is most effective early in the wet season prior to flooding and early dry season when flood waters recede, to allow access to wetlands and mimosa seedlings start to germinate. The effectiveness of herbicides applied in a foliar spray can be strongly influenced by weather conditions. Low humidity, high temperature and high wind conditions will reduce the effectiveness of herbicide and increase spray drift.

6.2.5 Basal bark application

Basal barking involves mixing an oil soluble herbicide with diesel, then spraying or painting a plant's stem or trunk to the point of saturation. The whole circumference of the stem or trunk should be sprayed or painted with the herbicide solution from ground level to a height of approximately 30 cm. It is important to treat every stem rising from the ground.

6.2.6 Cut stump application

The cut stump method involves cutting off a plant's stem or trunk, to leave a stump no higher than 15 cm above the ground. Stems may be cut with a chainsaw, hand saw, axe, brush-cutter or machete.

Cut stumps must be treated immediately with herbicide, as the cut can seal rapidly, preventing the absorption of herbicide. The herbicide solution should be applied directly onto the cut stump within 15 seconds of being cut. The herbicide may be applied using a knapsack, hand-held spray bottle or drench gun. Alternatively it may be painted on using a brush. This process may be carried out more effectively by two workers. A dye in the herbicide solution can be used to mark the stumps that have been treated. Please note that mimosa can regrow vigorously from untreated cut stems.

The cut stump method is most suitable for small, isolated outbreaks and is particularly appropriate in environmentally sensitive areas because it has a low impact on the soil and no impact on surrounding native vegetation or waterways. It is most effective when the plant is actively growing.

6.3 Non-chemical control

6.3.1 Physical removal

Hand pulling or grubbing can be used to remove small mimosa plants. Ensure all roots and seeds are fully removed and destroyed.

6.3.2 Stick raking

A stick rake attached to a bulldozer or tractor can remove the whole stump and root system of a plant while minimising disturbance and loss of topsoil. Immediate revegetation with pasture or native vegetation is necessary. Disc ploughing after clearing can provide a better seedbed for re-establishing pasture.

6.3.3 Chaining

Chaining involves removing mature plants by pulling a heavy chain between two bulldozers. Chaining is most suitable for dense infestations over large areas following treatment with herbicide. This option is best implemented at the end of the wet season when soil moisture is sufficient to allow efficient root removal.

6.3.4 Chopper rolling

A heavy drum covered in blades is pulled behind a tractor. This process knocks down and breaks up dead mimosa stick following herbicide control. This method is less disturbing to soil than others, reduces fire fuel load and is useful for large infestations.

6.3.5 Mulching

A tractor with a mulching instrument attached can be used to break up dead mimosa stems into small pieces. This process provides access and leaves a layer of mulch. Mulching is suitable for large, dense infestations and eliminates the need for burning.

6.3.6 Grazing

Cattle grazing next to mimosa infestations must be strictly managed, as cattle can readily spread seeds and any overgrazing can reduce growth of competitive native vegetation. Reduced stocking rates will limit mimosa seedling establishment.

6.4 Fire management

6.4.1 Pasture management

Fire plays an important part in pasture and land management in the NT; it can also be a very important tool in effective weed management. Managing fire will assist in the maintaining a competitive cover of pasture, so it is more difficult for mimosa to establish. In contrast, hot, uncontrolled fires may deplete native grass seed banks while stimulating germination of mimosa seeds. Mimosa is well suited to development in disturbed areas created by wildfires.

6.4.2 Weed control

Mimosa is very fire tolerant and survival rates of up to 90% and 50% can be expected for mature and juvenile plants respectively. For this reason fire can only be used as part of an integrated approach to weed management.

It is recommended that remnant mimosa is burnt after it has been treated with herbicide, as this will destroy residue, clear access for follow up control and kill most new germinants. Fire should only be used for this purpose in the early stages of a management program, as fire exclusion after this stage will help to suppress the growth of mimosa seedlings by maintaining native grass cover.

Burning can destroy seeds or it can promote the germination of previously dormant seeds. Any fire should therefore be followed up with herbicide application to destroy emerging seedlings.

6.4.3 When and how to burn

Well maintained and strategically located fire breaks and/or access trails can help to contain fires and provide access to control fires.

Back burning involves lighting small fire/s which burn back towards the fire front of a larger fire. By controlling the available fuel, back burning can assist in controlling the direction and spread of a wildfire.

Please note this plan does not attempt to provide information on fire safety with respect to uncontrolled wild/bush fires. Specialist advice should be sought from the following agencies if you believe that mimosa on or near your property may pose a fire risk. Contact your local Volunteer Fire Brigade Captain or local fire station for permits to burn if you live within a Northern Territory Fire and Rescue Service Emergency Response Area (NTFRS ERA). If you live outside a NTFRS ERA, contact your local area Fire Warden through the Bushfires Council on 8922 0844 (Darwin) or 8976 0098 (Batchelor). Any management incorporating burning must be in accordance with the *Bushfires Act* and *Fire and Emergency Act*.

6.5 Buffer zones

Mimosa grows extremely quickly and under suitable conditions populations can double in size every two years. Spread is facilitated by the production of vast numbers of seeds that are produced in clustered pods. When mature, the seed pods turn brown and break into segments. Hairs on the segments enable the pods to float, allowing floods and tidal movement to spread seeds vast distances. Individual mimosa seeds can inadvertently be transported by animals, machinery, vehicles (including boats) and people. The seeds are particularly hardy and can remain viable in soil for many years. Further, the seeds can germinate after being passed through the digestive tract of cattle and are resistant to fire.

Given the high capacity for seed distribution, the control of spread must be prioritised as a management aim. This plan stipulates that buffer zones must be established and maintained on all properties containing mimosa to assist containment. A buffer zone is a designated area that aims to isolate major infestations from either adjoining properties or

areas on the same property which have controllable levels of mimosa. Buffer zones cannot contain any mature mimosa plants or seedlings.

Buffer zones may surround the entire property, however it is preferred that a buffer zone only surrounds the area/s containing mimosa. It is recognised that a major infestation may span more than one property. If this is the case, it may be more appropriate that a buffer is established around the infestation, rather than around the property.

It is recommended that a GPS is used to record the outermost extent of all major infestations; the waypoints collected can then be used to create accurate maps that can be used for planning purposes. Any expansion or contraction in the infestation can then be assessed and control efforts may be altered accordingly. The establishment of photo monitoring points will assist with buffer maintenance and reporting requirements. For information on the establishment of monitoring programs please contact the Weed Management Branch for advice. More information on controlling seed spread is included in Section 7.

Buffer zones do not require the clearing of all native vegetation, however they should be of a sufficient width to prevent the inadvertent spread of mimosa to surrounding properties. Buffer zones do not detract from the requirement for fire access trails (fire breaks) to be established and maintained under the *Bushfires Act* and *Fire and Emergency Act*. Clearing of vegetation for buffer zones may also be subject to approvals as required by the *Planning Act* or *Pastoral Land Act*.

6.6 Biological control

Biological control (biocontrol) is the use of living organisms to control pest populations. In weed control, biocontrol involves searching for, comprehensively testing, then releasing natural enemies of an introduced plant, usually an insect or pathogen, to help to manage it. The aim of biocontrol is to restore some natural balance, so that introduced plant species have a less competitive advantage over native plants.

Biocontrol methods should always be applied in conjunction with other weed control measures and improved land management techniques. Land managers should be aware of the biological control agents which have been released in the NT and support their release, management and surveillance where possible.

Fifteen agents have been released against mimosa since the NT Biocontrol Research Program started in 1979. Thirteen of these were insects and two were fungal pathogens.

The first biocontrol agent released against mimosa was *Acanthoscelides* (*Acanthoscelides puniceus*) in 1983. The larvae of these beetles feed on mature seed, each larva destroying a single seed. The beetles are established on most mimosa infestations in the NT and have helped to significantly reduce the amount of seed produced.

Neurostrota (*Neurostrota gunniella*) is a small moth that was introduced to the NT in 1989. This moth has established and is present on most mimosa plants in the NT. The larvae bore into the stems of mimosa causing leaf drop and tip death.

Larvae of the moth, *Carmenta mimosa*, also introduced in 1989, tunnel into stems, branches and the trunks of mimosa plants, causing death of branches and reducing plant growth and seed production. *Carmenta* has established on most mimosa infestations in the Top End.

Two species of flower feeding weevils (*Coelocephalapion pigrae* and *C. aculeatum*) were released on to the Adelaide River catchment in the early 1990's. Only one of them, *C. pigrae*, has persisted, probably due to its ability to feed on the leaves during the dry season when there are few flowers. It can be found on almost every mimosa infestation across the NT.

The root, seed and leaf feeding beetle (*Malacorhinus irregularis*) has also become well established in the Top End. It is occasionally present in large numbers, causing significant damage to mimosa. Adult beetles feed on the young leaves of seedlings, larvae live and pupate in the soil and feed on the seeds, nodules, roots and leaves of seedlings.

The leaf feeding moth, macaria (*Macaria pallidata*) is a creamy coloured moth that has a wingspan of about 2 cm. Some have two black spots on their wings. The larvae can be either brown or green and move in a looping motion. The larvae feed on the leaves and can cause severe defoliation. Macaria is well established on mimosa infestations in the Top End.

The leaf feeding moth, leuciris (*Leuciris fimbriaria*) is a small white moth, which is characterised by the gold edging present on the wings. The larvae, which feed on the leaves of mimosa, are green with a white stripe down either side. These insects are currently being reared and released. The root and leaf feeding beetle, *Nesaecrepida infuscata* is also in the process of being reared and released.

Other species, including the fungi *Phloeospora mimosae-pigrae* and *Diabole cubensis*, the green seed weevil (*Chalcodermus serripes*), and the young green seed weevil (*Sibinia fastigiata*) have been reared and released, but did not establish.

The Weed Management Branch website provides further information on the biocontrol program for mimosa in the NT, and is located at <http://www.lrm.nt.gov.au/weeds2/manage/biological/mimosa>.

6.6.1 Further information

Further information on the eradication and control methods described in this plan can be found in the *Northern Territory Weed Management Handbook*.

The *Mimosa pigra National Best Practice Management Manual* details what considerations should be incorporated into the development of a property weed management plan for mimosa. The manual contains further information on mimosa mapping, application of herbicides, mechanical clearing, biological control, follow up control and best practice land management, as well a range of case studies. Copies of the publication are available by phoning the Weeds Management Branch in Darwin on (08) 8999 4567.

7. Developing a weed spread prevention program

Spread prevention is the most successful and cost effective way of managing weeds. As previously described mimosa seeds can be readily spread through a number of natural and non-natural means. In particular long distance spread can be very problematic from a management perspective. Seed spread facilitated by water flow (rain, floods), feral animals and domestic livestock and vehicles can result in distribution to environments which may be highly suitable for germination and establishment including floodplains, creek lines and riverbanks.

7.1 Hygiene procedures

Vehicles, machinery and boats are recognised as a major source of mimosa spread. Seeds can be transported by vehicles and machinery used in mimosa infested areas. The following actions are recommended for inclusion into prevention programs to reduce the weed spread:

- a) map and monitor mimosa infestations;
- b) always work from clean areas back toward infested areas;
- c) schedule control works to occur prior to seed set;
- d) designate wash down areas (see following page);
- e) ensure contractors and machinery operators are familiar with hygiene protocols and weed identification; and
- f) ensure machinery entering and leaving your property is clean.

7.2 Wash down facilities

Wash-down facilities should be established on all affected properties. Such facilities may utilise high pressure wash-down, compressed air blast, vacuuming and/or physical removal (e.g. hand brush). Wash down facilities:

- a) must be selected to minimise the risk of spread (on or off-site);
- b) must be regularly checked for weed seedlings which may have germinated from seeds washed off vehicles etc. Any weeds should be controlled immediately; and
- c) should be sited in degraded areas to minimise risk of undetected weed spread.

Where it is impractical to establish a wash down facility, consideration is to be given to adopting alternative options and solutions to manage seed transfer.

7.3 Avoiding weed seed transfer

It is illegal to transport declared weeds. You must dispose of all weed material on site. Seeds should be incinerated at high temperatures to ensure they are destroyed.

Seed transfer can also occur through the transport and sale of contaminated products. Care must be taken to ensure that any gravel, sand, livestock or other product moved between properties is free of mimosa seeds.

7.4 Integrated natural resource management

Weed management should be closely linked to broader natural resource management at the property and catchment levels. Weed spread and germination can be enhanced in degraded areas, such as those impacted by erosion, wild fire and feral animals. These issues must be addressed in a weed seed spread prevention program if they are present in the area being managed.

8. Tracking progress and judging success

A property weed management plan should include realistic time frames and goals, recognising that achievements, particularly with regards to established weed populations, may only become evident in the long term. It is important to document weed occurrences and the control methods used so that success or failure can be critically analysed. Accurate records

can enable a management program to be reworked or fine tuned depending on the need (refer Appendix C).

8.1 Local level

8.1.1 Follow up control

A key element in any weed management program is inspecting and, if necessary, re-treating eradication areas, buffers and containment areas. Areas where herbicide has been applied must be revisited no less than four weeks after spraying but prior to seed set in May to ensure that the plant is dead. Follow up control to kill any regrowth/new germinants is to be done for at least five years after treatment; seeds can remain dormant for many years so it is essential that previous infestation areas continue to be monitored. Continual maintenance is imperative, as reinfestation may only be one growing season away if vigilance is not maintained.

8.1.2 Maintaining records

It is important to keep track of what is happening on a broad scale; i.e. is the weed control being undertaken contributing to the objectives of this plan? To accurately determine if, and what, progress is being made, records must be maintained that show weed control activities (outputs) and the results of the activities (outcomes).

An example of an appropriate monitoring and reporting format is at Appendix C. A Weed Management Officer may direct individuals to provide specific information where it is considered necessary.

8.1.3 The supply of mimosa distribution data

The supply of weed data to the Weed Management Branch by individuals and groups is fundamental to planning, prioritising and coordinating strategic weed management across the NT. The positive identification of mimosa in an area where it has not previously been found must be reported directly to the Weed Management Branch, as immediate action may be deemed necessary. A more detailed description of mimosa on your property can be submitted in accordance with the *Guidelines for Weed Data Collection in the NT*. This level of information collection and transfer is more important for large scale land owners, however all data received will be collated and recorded.

8.2 Territory level

All statutory Weed Management Plans endorsed under the *Weeds Management Act* must be reviewed every three years.

8.2.1 How will we know if this Weed Management Plan is working?

Full compliance with a Weed Management Plan can require a great deal of effort, commitment and investment from land managers, particularly from those who are already affected by declared weeds. For this reason it is essential that the NT Government monitors whether the stipulated management actions are contributing towards the identified outcomes at a Territory level.

8.2.2 Adaptive management

Each Weed Management Plan has been drafted using the best information available at the time of writing. However, new information may become available which should be included

in, or influence the structure and content of this plan. Allowing for this flexibility enables an adaptive management approach.

The Territory Government is committed to applying an adaptive management approach to weed management across the Territory. Specifically it will use data and feedback gathered from land managers and other stakeholders to refine and improve future management decisions and ultimately, the weed management plans. Continuous improvement can only be achieved if the following can be determined:

- if investments in weed management are resulting in progress towards the identified objectives; and
- if the recommended management actions are achieving the most effective and efficient control outcomes.

8.2.3 Performance indicators

A performance indicator is something which can be used to assess performance. The following indicators will provide a way to measure the performance of this plan against its objectives. This plan also sets and annually reviews targets against the stipulated management requirements (refer Appendix D).

Table 3: Performance indicators

Performance indicator	What will be measured?	How will it be measured?
Increased awareness	Knowledge of issues and management Compliance	<p><i>Quantitative</i>; the following will be recorded:</p> <ul style="list-style-type: none"> • number of enquiries to weedinfo.dlrm@nt.gov.au; • number of hits on internet site www.nt.gov.au/weeds; • number of reported breaches of the Act; and • number of major awareness raising events held and number of attendees. <p><i>Qualitative</i>; the following will be undertaken:</p> <ul style="list-style-type: none"> • key land managers to be questioned about their knowledge of relevant Weed Management Plans; and • liaison and consultation with land managers from a range of land tenures will continue.
Better information	Distribution data	Amount of data submitted by the public Strategic and targeted survey programs developed and implemented
	Density data	
	Areas under active management	
Better management	Eradication	Strategic and targeted monitoring programs developed and implemented Reporting

8.2.4 Government commitments and accountability

The Weed Management Branch will work with other Divisions from DLRM and other Territory Government Departments to design and implement a monitoring program that allows this management plan, the management actions contained within it and the outcomes produced to be evaluated. The monitoring program should have sufficient resolution to allow management outcomes at a local through to regional management scale to be evaluated.

The Minister will consider advice from the public, community and industry stakeholder groups and Weed Advisory Committees prior to approving, or making changes to, any statutory weed management plan.





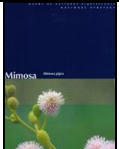
8.3 Communication

Effective and cooperative mimosa management can only be achieved if all stakeholders understand the risks posed by mimosa and the control methods needed to strategically manage these risks. The Territory Government, through the Weed Management Branch of DLRM has an obligation to develop a communication strategy which must ensure all stakeholders understand the risks posed by mimosa, have access to the most appropriate control methods for their situation, and have a full understanding of their legal obligation with respect to mimosa control.

It is recognised that effective communication is always a two way process. The Territory Government relies on receiving feedback from people who are involved in on-ground mimosa management so that this weed management plan and the communication strategy can be continually assessed, and subsequently improved. Please contact the Weed Management Branch with any information which could be used to refine the approach to managing mimosa and other declared weeds in the NT.

9. Support and information for land managers

The Weed Management Branch (DLRM) will continue to provide training, advice and extension materials related to support improved mimosa management which is consistent with the goals of this management plan. The following documents are available by contacting your local Weed Management Branch or accessing the internet site <http://www.nt.gov.au/weeds>.

	Mimosa Weed Identification Table	Contains photos and written descriptions to assist with identification.
	Mimosa WeedNote	Provides information on the mimosa identification, impacts, habitat, distribution and management of mimosa.
	Recommendations for the Management of <i>Mimosa pigra</i>	Contains information on best management practice in an illustrated, step by step guide.
	Weeds of National Significance – Weed Management Guide for <i>Mimosa pigra</i>	A nationally developed management guide which contains case studies. http://www.weeds.org.au/WoNS/mimosa/
	Biological Control of <i>Mimosa pigra</i> Identikit	This provides photographs of biological control agents and their impacts. It has been designed to assist land managers to determine if biocontrol agents have established on their properties.
	<i>Mimosa pigra</i> Best Practice Management Manual	Contains detailed information on best management practice.
	Mimosa in the NT: A Summary of Current Knowledge	Details the process and information which formed the basis of the decision to maintain the declaration status of mimosa in accordance with the <i>Weeds Management Act</i> . It describes the biology and ecology of mimosa, the environmental, economic, cultural and social impacts of mimosa and the feasibility of mimosa control.
	NT Weed Risk Assessment Report: <i>Mimosa pigra</i> (Mimosa)	This document cites the sources of information, from literature or expert personal observation, that were used to determine weed risk and feasibility of control ratings for each weed species assessed. These findings have guided the development of the management recommendations.
	NT Weed Management Handbook	Provides information on strategic and planned approaches to weed management, including integrated weed control methods. Specific information is provided on herbicides registered for use in the NT. The 37 'Weed control option tables' include a colour photo of the weed in question, list which herbicides are registered for use, indicate optimum treatment times and which method/s can be employed for maximum effectiveness.
	Weeds of National significance National Strategy for <i>Mimosa pigra</i>	A strategic plan to protect Australia from the weed impacts of <i>Mimosa pigra</i> and to restore infested natural habitats and productive lands and waters by integrated and cost effective research, planning, implementation and management.

The following documents are also available:

- Weed Risk Management System for the NT (Fact Sheet);
- Guidelines for Weed Data Collection in the Northern Territory;
- Introductory Weed Management Manual; and
- Participatory Evaluation for Landcare and Catchment Groups – A Guide for Facilitators http://live.greeningaustralia.org.au/nativevegetation/pages/pdf/Authors%20W/14b_Woodhill_Robins.pdf.

This plan is consistent with the:

- *Weeds Management Act* and the *Weeds Management Regulations* <http://www.nt.gov.au/dcm/legislation/current.html>;
- National Weed Strategy; and
- The National Weed Spread Prevention Action Plan.

Appendix A: Summary of management requirements and related actions – mimosa in class A/C zone

Objectives	Management Obligations	Management Actions
<p>To eradicate existing infestations and prevent further establishment of mimosa in the A/C zone.</p>	<p>Eradicate established populations, isolated plants and outbreaks.</p>	<p>Design and implement a survey and eradication program for mimosa, which incorporates an annual survey and control program. A property management plan should be used to determine areas of priority and establish the most appropriate control methods:</p> <ul style="list-style-type: none"> • Chemical control (section 6.2); • Non-chemical control (section 6.3); • Fire management (section 6.4); and <p>Buffer zones should be implemented on all properties containing mimosa (section 6.5) for the duration of any eradication program.</p>
	<p>Implement early detection and management programs.</p>	<p>Regularly monitor/survey land, including previously treated areas, to identify new or re-establishing mimosa infestations at an early stage. Notify the Weed Management Branch of the presence of mimosa when it is identified in an area which it has not been found previously. Eradicate new and outlying populations immediately.</p>
	<p>Design and implement a weed spread prevention program.</p>	<p>The design and implementation of a seed spread prevention program (section 7), must ensure:</p> <ul style="list-style-type: none"> • mimosa seed is not moved by vehicles, machinery or equipment; • mimosa is not moved along transport corridors, including waterways; • all gravel, sand, livestock or any other product moved within or between properties is free of mimosa seeds; and • seed transport and germination is not facilitated by feral animals and poor land condition. <p>All recreational land users, including fishermen, hunters and tour operators must ensure they are not spreading mimosa seeds on boats, vehicles or equipment.</p>
<p>To apply an adaptive approach to weed management.</p>	<p>Develop and implement nationally consistent and targeted extension products and activities.</p>	<p>Information and awareness resources and campaigns are developed and implemented to raise awareness and capacity of landholders to control and contain the spread of mimosa.</p>
	<p>Develop and maintain an ongoing monitoring program.</p>	<p>A monitoring program should be developed in accordance with the Monitoring Report Template attached at Appendix C. A Monitoring Report should record the type and location of all management actions undertaken, including active control, survey works and spread prevention. The result of these actions should be recorded, even if the desired result was not achieved.</p>
	<p>Maintain an accurate record of control methods applied and results achieved for possible collation at a Territory level.</p>	<p>A monitoring and management record, which includes current and past mimosa locations, may be requested at any time by the Weed Management Branch.</p>
	<p>Evaluate the efficiency of control and containment programs over time.</p>	<p>Determine the success of various management actions employed and use this information to fine tune the performance of your management program.</p>

Appendix B: Summary of management requirements and related actions – mimosa in class B/C zone

Class B/C Objectives	Management Obligations	Management Actions
<p>To control the growth and spread of mimosa in the B/C zone.</p>	<p>Eradicate isolated plants and outbreaks.</p>	<p>Design and implement an annual control and containment program for mimosa. A property management plan should be used to determine areas of priority and establish the most appropriate control methods:</p> <ul style="list-style-type: none"> • Chemical control (section 6.2); • Non-chemical control (section 6.3); • Fire management (section 6.4); and <p>Appropriate buffer zones should be implemented on all properties containing mimosa (Section 6.5).</p>
	<p>Implement early detection and eradication programs in all areas outside major infestations.</p>	<p>Regularly monitor/survey land, including previously treated areas, to identify new or re-establishing mimosa infestations at an early stage. Any plants or infestations should be eradicated immediately. Notify the Weed Management Branch of the presence of mimosa when it is identified in an area which it has not been found previously. Eradicate new and outlying populations immediately.</p>
	<p>Active containment of major infestations.</p>	<p>Major infestations should be actively contained through an appropriate integrated control program. Containment areas should be accurately geo-referenced and documented to ensure the infestation does not gradually expand. Photo monitoring points will assist with buffer maintenance and reporting requirements. Buffer zones must be established and maintained on all properties in the Class B management zone which have major infestations (refer section 6.5). Buffers, of a suitable width must be maintained by chemical, mechanical or physical means. Landowners should also avoid creating conditions which would promote mimosa germination and spread, which may include managing feral animals and controlling erosion and fire on their properties. Pastoralists must implement grazing land management principles which will encourage the growth of native pastures, limit the establishment of mimosa seedlings and prevent any spread through cattle movement. Land managers should actively release, establish, manage and monitor biological control agents in major infestations.</p>
	<p>Prevent/minimise seed production.</p>	<p>Seed production within major infestation areas is to be suppressed where possible using appropriate control methods taking into consideration mimosa's growth and reproductive cycles (refer section 6.1.3).</p>
	<p>Design and implement of a seed spread prevention program.</p>	<p>The design and implementation of a weed seed spread prevention program (refer section 7), must ensure:</p> <ul style="list-style-type: none"> • mimosa or seed is not moved on machinery or equipment; • mimosa is not moved along transport corridors, including waterways; • all gravel, sand and livestock (or any other product) moved within or between properties are free of mimosa seeds; and • seed transport and germination is not facilitated by feral animals and poor land condition. <p>Recreational land users, including fishermen, hunters and tour operators must not spread mimosa seeds on boats, vehicles or equipment etc.</p>
<p>To apply an adaptive approach to weed management.</p>	<p>Develop and maintain an ongoing monitoring program.</p>	<p>A monitoring program should be developed in accordance with the Monitoring Report Template attached at Appendix C. A Monitoring Report should include information on the location and density of all mimosa infestation on the property (standardised weed densities are described in <i>Guidelines for Weed Data Collection in the Northern Territory</i>). A record should also be kept on the type and location of all management actions undertaken, including active control, spread prevention and survey works. The result of these actions should be recorded, even if the desired result was not achieved. Any expansion or contraction in the infestation can then be assessed and control efforts may be altered accordingly.</p>
	<p>Maintain an accurate record of control methods applied and results achieved for possible collation at NT level.</p>	<p>A monitoring and management record may be requested at any time by the Weed Management Branch.</p>
	<p>Evaluating the efficiency of control and containment programs over time.</p>	<p>Determine the success of various management actions employed and use this information to fine tune the performance of your management program.</p>

Appendix C: Suggested mimosa monitoring report template

- Your monitoring report should follow the format provided below. The example provided is suited to a property in the Class B/C zone.
- Digital versions of the form are available at <http://www.nt.gov.au/weeds/> or by e-mailing weedinfo.dlrm@nt.gov.au.
- Please contact your nearest Weed Management Branch if you need assistance.

Property owner	
Mailing address	
Email address	
Phone	
Fax	
Mobile	
NT Portion/Lot number	
Region/Hundred	
Period of report	

EXAMPLE ONLY

Management Requirements	Management Actions	Mimosa location (scale map or GPS points)	Action taken (outputs) (include date control technique)	Result of action (include date and observation notes)	Are any management changes necessary?	Decision Future action/next step
Eradication of isolated plants and outbreaks.	Design and implement an annual control and containment program for mimosa. A property management plan, including a weed management map should be developed.	Buffalo Ridge Pandanus Paddock Refer to map	07 March 2008 See attached property management plan. Control, with aim to eradicate, undertaken in 4 areas outside of major infestation area - spraying/soil applied herbicide application.	20 June 2008 Some regeneration of plants.	Start control during build-up (Oct – Dec).	
Implementation of early detection and eradication programs in all areas outside major infestations	Active control of mimosa outside of major infestation areas.	Eagle paddock Upstream of crocodile billabong Western and eastern sides of catfish creek	07 October 2008 Graslan applied	As above. Some plants treated with graslan survived as rain did not immediately eventuate.	Soil applied herbicides should be applied to damp soil prior to rain for more effect. Spray only when rain is definitely on its way.	20 August 2009 Density and area of mimosa infestation reduced by approximately 80%. Previously absent native grasses now evident.
Active containment of major infestations	Grazing land management principles implemented. Buffer zones to be established.	Crocodile billabong	1 June 2008 Infestation GPS'ed at 24 ha Map overlaid onto sat image 03 Dec 2008 20 m perimeter buffer marked out with Lochie Daniels (NTP 4XX). Starane applied	Buffer designed and established.	No.	20 August 2009 Majority of mimosa excluded from buffer zone. Minimal evidence of spread in adjoining paddock.
The prevention/minimisation of further seed production	Suppression of seed production.	Crocodile billabong	Nov 08 Aerial spraying Dec 08 Burnt stick	No new mimosa infestations were identified.	No.	20 August 2009 No new mimosa infestations were identified in clean areas.
The design and implementation of a seed spread prevention program	The design and implementation of a seed spread prevention program.		11 September Installation of wash down bays and procedures. Weed ID manuals put in shed/vehicles.			

Appendix D: Targets

Objective 1: To eradicate existing infestations and prevent further establishment of Mimosa in the A/C zone

Management requirement	Target	Priority	Responsibility	Completion Timeframe		
				Yr 1 - 3	Yr 3 -5	Yr 5 – 10
<ul style="list-style-type: none"> Eradicate established populations, isolated plants and outbreaks. Implement early detection and management programs. Design and implement a seed spread prevention program. Prohibit the production, sale or purchase and transport of mimosa, seed or products. 	Identify location, extent and density infestations of mimosa in the A/C zone.	1	All land users	√		
	Develop a mimosa mapping and monitoring program for infestations in the A/C zone.	1	NT Government	√		
	Property weed management plans are developed for all properties in the A/C zone with mimosa infestations.	1	All land managers in A/C zone		√	
	Prioritise areas for control by identifying isolated and small infestations which are easy to treat, significant seed sources or areas with a high probability of seed spread and/or infestations in high value or vulnerable areas.	1	All land managers in A/C zone	√		
	Programs developed and implemented to eradicate infestations of mimosa on all NT Government controlled lands in the A/C zone.	1	NT Government	√		
	Programs developed to eradicate high priority infestations of mimosa in the A/C zone.	1	All land managers in A/C zone		√	
	All mimosa infestations in the A/C zone are under active eradication programs.	1	All land managers in A/C zone		√	
	The production of seed and spread of mimosa within the A/C zone is prevented.	1	All land users		√	
	The number and size of infestations of mimosa in the A/C zone is reduced.	1	All land managers in A/C zone		√	
	Results of eradication activities are obtained from land holders.	1	NT Government	√	√	√

Objective 2: To control the growth and spread of mimosa in the B/C zone

Management requirements	Target	Priority	Responsibility	Completion Timeframe		
				Yr 1 - 3	Yr 3 -5	Yr 5 – 10
<ul style="list-style-type: none"> Eradicate isolated plants and outbreaks. Implement early detection and eradication programs. Active containment of major infestations. Prevent/minimise further seed production. Design and implement a seed spread prevention program. 	Identify location, extent and density of infestations of mimosa in the B/C zone.	1	All land users	√		
	Develop a mimosa mapping and monitoring program for infestations in the B/C zone.	2	All land users		√	
	Property weed management plans are developed for all properties in the B/C zone with mimosa infestations.	2	All land managers in B/C zone		√	
	Prioritise areas for control by identifying isolated and small infestations which are easy to treat, significant seed sources or areas with a high probability of seed spread and/or infestations in high value or vulnerable areas.	1	All land managers in B/C zone	√		
	To reassess declared boundaries of the AC/BC zones with the view to extending the A/C zone (i.e. decreasing the extent of the B/C zone) by amending the boundary declared under the <i>Weeds Management Act</i> , so that the focus is increasingly on mimosa eradication.	1	NT Government		√	
	Results of management activities are obtained from land holders.	2	NT Government	√	√	√
	The number and size of infestations of mimosa in the B/C zone is reduced.	1	All land users			
	Mimosa is actively managed in the B/C zone.	1	All land managers in B/C zone			
	Programs developed and implemented to control and/or eradicate (where feasible) mimosa on all NT Government controlled lands in the B/C zone.	1	NT Government	√		
	Programs developed and implemented to manage infestations of mimosa in the B/C zone.	2	All land managers in B/C zone		√	
	Programs developed and implemented to prevent the spread of mimosa.	1	All land users	√		
	Mimosa infestations in the B/C zone are contained.	1	All land users		√	

Objective 3: To apply an adaptive approach to weed management:

Management requirements	Target	Priority	Responsibility	Completion Timeframe		
				Yr 1 - 3	Yr 3 -5	Yr 5 – 10
<ul style="list-style-type: none"> • Develop and implement nationally consistent and targeted extension products and activities. • Develop and maintain an ongoing monitoring program. • Maintain an accurate record of control methods applied and results achieved for possible collation at a Territory level. • Evaluate the efficiency of control and containment programs. 	The Northern Territory Weed Spread Prevention Strategy is developed.	2	NT Government	√		
	A Weed Watcher Reporting System for the Northern Territory is investigated.	3	NT Government		√	
	Results of mimosa management and eradication activities are collated and published for the Northern Territory.	2	NT Government		√	√
	Results of successful eradication or control activities or trials are shared.	3	NT Government/CDU/Research organisations	√		
	Information and awareness resources and campaigns are developed and implemented to raise awareness and capacity of landholders to control and contain the spread of mimosa.	2	NT Government/Community Groups/NGOs	√	√	
	The A/C and B/C zone declaration boundary is reviewed with the view to expand the A/C zone.	3	NT Government		√	√
	Information and advice on alternative pastures is developed and provided to landholders.	2	NT Government		√	√
	Review the effectiveness of Year 1-3 targets of Weed Management Plan.	2	NT Government		√	

WEED MANAGEMENT BRANCH CONTACTS

For more information or advice in relation the identification, management or monitoring of weeds please contact the Weed Management Branch:

Phone: (08) 8999 4567
Email: weedinfo.dlrm@nt.gov.au
Website: <http://www.nt.gov.au/weeds>

The NT Herbarium can also provide plant identification advice

Phone: (08) 8999 4516