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# Weed Management Plan

## Wellard Integrated Live Export Facility

Report Number 23919.79936



*Prepared for*



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## 1. Introduction

This Weed Management Plan (WMP) has been prepared to assist identification and management of issues and risks associated with weeds during the operational phase of the Darwin Integrated Live Export Facility, 2658 Stuart Highway, Livingstone Northern Territory (NT) 0822 (Figure 1). It is not a regulatory requirement under current legislation.

However, a WMP will assist the landowner to meet any management statutory obligations under the Northern Territory Weed Management Act 2001, which requires all land holders, land owners and land users to comply with the following weed declarations:

- Class A weed: To be eradicated,
- Class B weed: Growth and spread to be controlled, and
- Class C weed: Introduction into the Northern Territory is to be prevented.

Obligations under this legislation include:

- Taking all reasonable measures to prevent the land being infested with a declared weed,
- Preventing a declared weed from spreading to other land, and
- Notifying an officer of the presence of the declared weed within 14 days after first becoming aware of a weed that has not previously been, or known to have been, present on the land.

### 1.1 Objectives

This WMP aims to assist Wellard Rural Exports Pty Ltd to:

- Develop the weed management section of a whole property plan for the Darwin Integrated Live Export Facility;
- Improve profitability and sustainability of the Darwin Integrated Live Export Facility by ensuring weed management activities and deployment of resources are scheduled at the optimal time;
- Monitor the effectiveness of implemented control measures;
- Set and achieve weed management and monitoring goals; and
- Report progress to local and state governments if required.

### 1.2 Document review

This WMP will be reviewed annually. It will also be reviewed when circumstances change that may affect the content of this plan.

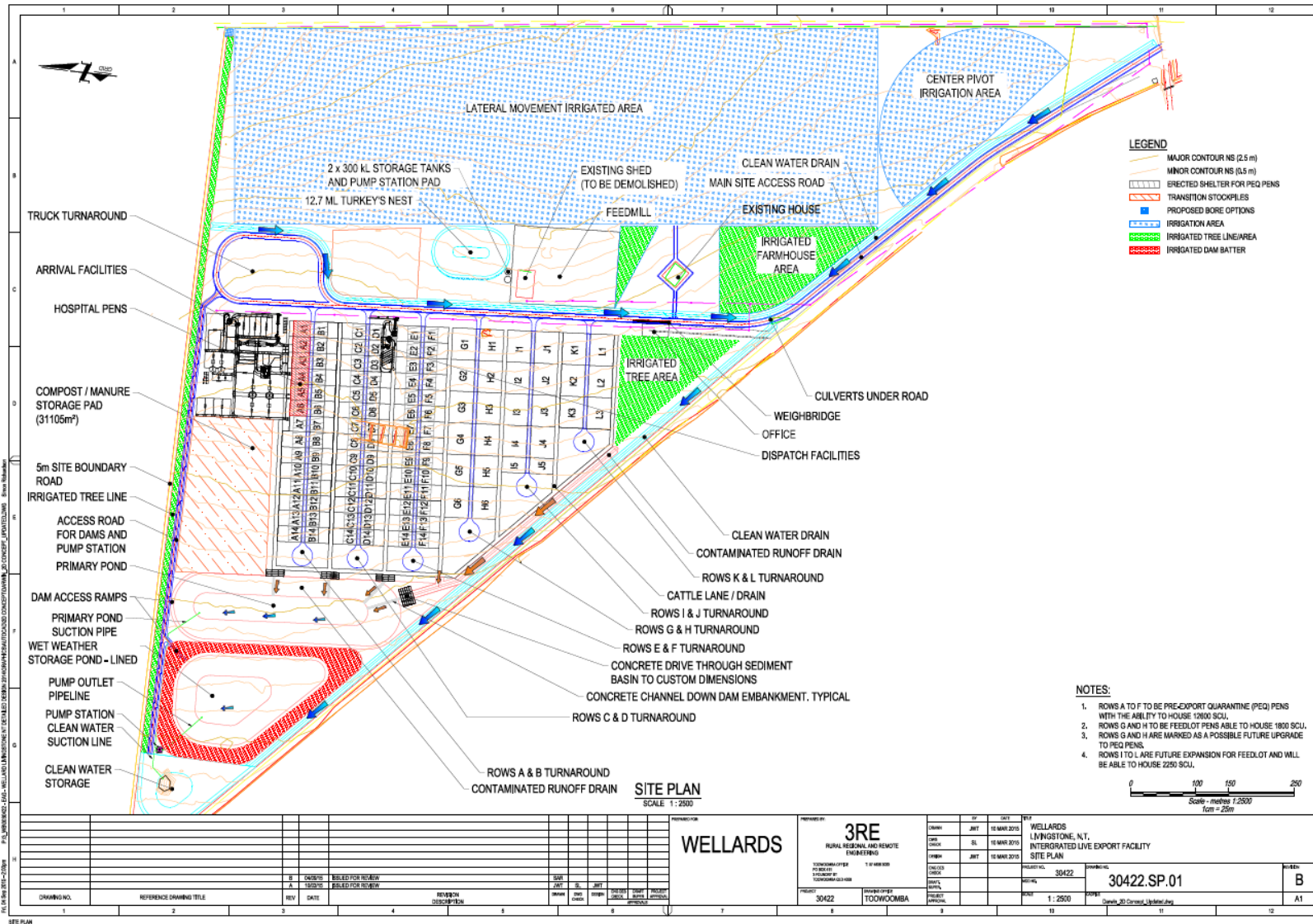


Figure 1 Site plan

## 2. Vegetation Assessments

### 2.1 Declared weeds found onsite

A rapid vegetation assessment of the site found eight (8) weed species declared as Class B and C under the *NT Weed Management Act 2001*:

- *Andropogon gayanus* (Gamba grass)
- *Sida acuta* (Spinyhead sida)
- *Senna obtusifolia* (Sickle pod)
- *Sida cordifolia* (Flannel weed)
- *Azadirachta indica* (Neem)
- *Hyptis suaveolens* (Hyptis)
- *Lantana camara* (Lantana)
- *Cenchrus pedicellatus* (Annual mission grass)

The following figures show the locations and densities of the above listed weeds on the site. Appendix A provides an overview of the characteristics of the weed species listed above and Appendix B describes control measures recommended by the Northern Territory Government (2015).

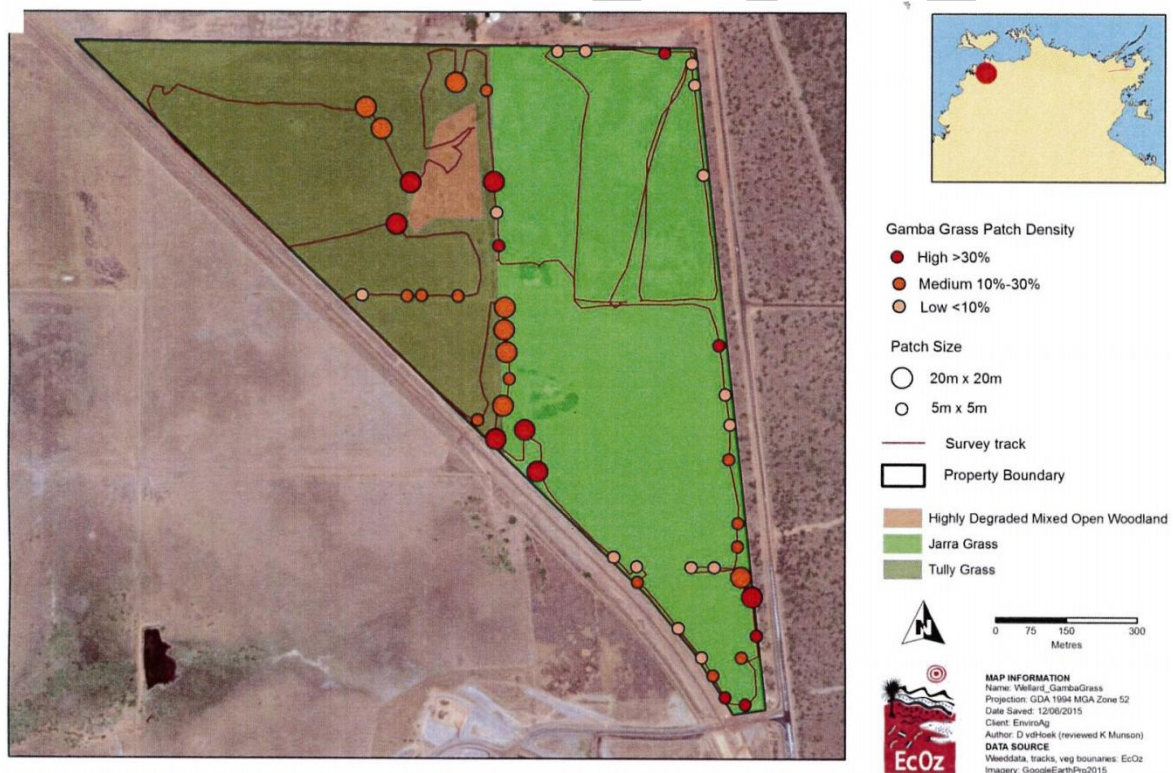
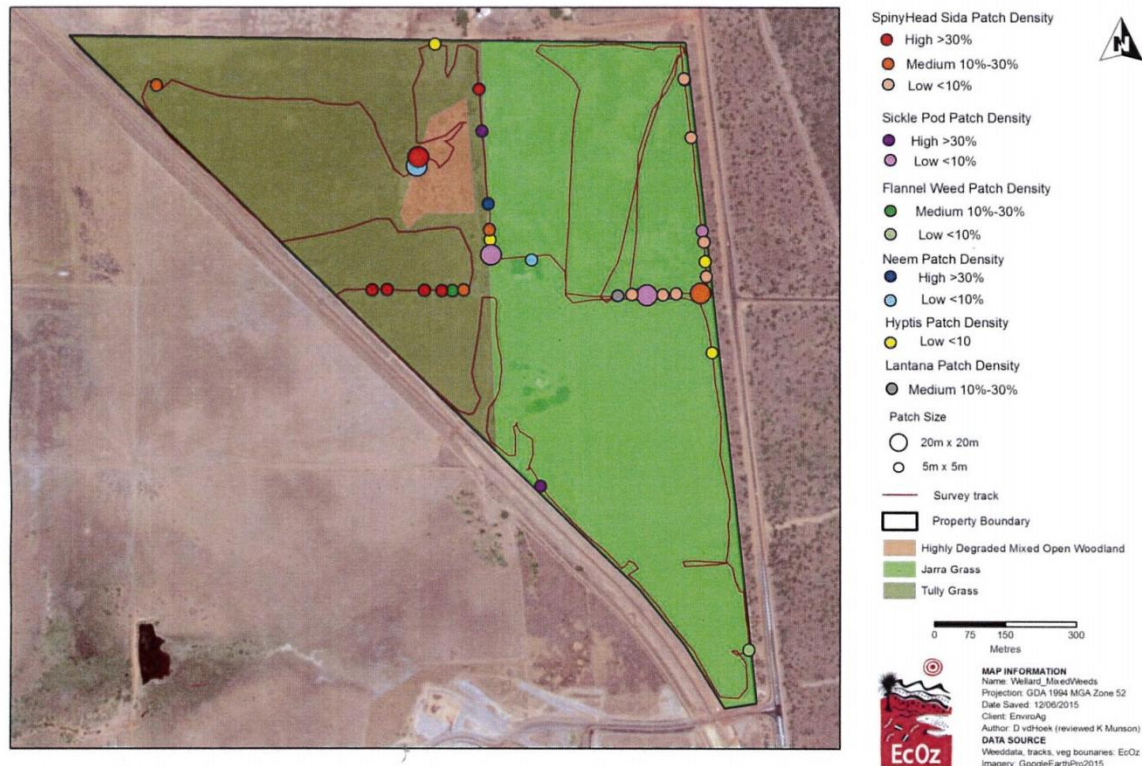


Figure 2 Distribution of *Andropogon gayanus* (Gamba grass)



**Figure 3** Distribution of all other declared weed - *Sida acuta* (spinyhead sida), *Senna obtusifolia* (sicklepod), *Sida cordifolia* (flannel weed), *Azadirachta indica* (neem), *Hyptis suaveolens* (hyptis), *Lantana camara* (lantana)

### 2.1.1 Potential impacts of weeds found onsite

The proliferation of these environmental weeds on and adjacent to this site may have significant impacts, including increased intensity of fires, toxic effects on stock, degradation of water systems through formation of thick mats that impede light and block drains during wet weather, as well as legal implications for failing to control weeds. The impacts of each of these weeds on native flora, fauna and livestock have been listed in Appendix A.

## 2.2 Declared weeds found on adjacent sites

The following declared weeds have the potential to threaten this site, but are not yet a problem. These weeds have been found on neighbouring properties (Northern Territory Government, 2015b), except for water hyacinth, mimosa and parkinsonia, which have been mapped as potential weeds for this area by the Department of the Environment (2013). Descriptions and photographs of these weeds can be found in Appendix C.

- *Hymenachne amplexicaulis* - Olive hymenachne (Class B/C)
- *Jatropha gossypifolia* - Bellyache bush (Class A/B/C)
- *Cenchrus polystachios* – Perennial Mission grass (Class B/C)
- *Salvinia molesta* – Salvinia (Class B/C – report to the Department of Land Resource Management immediately if found)
- *Sida rhombifolia* - Paddy's Lucerne (Class B/C)
- *Stachytarpheta australis* - Branched porterweed (Class B/C)
- *Themeda quadrivalvis* - Grader grass (Class B/C)
- *Stachytarpheta spp.* – Snake weeds (Class B/C)
- *Eichhornia crassipes* - Water hyacinth (Class A/C – report to the Department of Land Resource Management immediately if found)
- *Mimosa pigra* – Mimosa (Class B/C)
- *Parkinsonia aculeate* – Parkinsonia (Class B/C)



### 3. Roles and responsibilities

The roles and responsibilities pertaining to this plan are highlighted in table 1.

**Table 1 Weed management roles and responsibilities**

Position	Responsibilities
ILEF Manager	<ul style="list-style-type: none"> <li>Ensure that all declared noxious weeds are identified, reported and eradicated as required by regulations</li> <li>Ensure that this WMP is implemented and reviewed</li> <li>Ensure that all personnel are aware of and adhere to WMP procedures</li> <li>Undertake continued training of all staff in weed identification</li> </ul>
Feedmill/Farming Officer	<ul style="list-style-type: none"> <li>Inspect individual components of waste treatment facility before directing treated material to other component</li> <li>Maintain and act upon Weed Control Register</li> <li>Ensure that weed treatment records are completed for all treatments</li> <li>Perform regular surveys to identify noxious weeds and undertake any control programs as necessary</li> </ul>
Livestock Officer	<ul style="list-style-type: none"> <li>Inspect vehicles for seed and soil when entering site</li> <li>Implement wash-down procedures</li> <li>Maintain a wash-down log for vehicular weed hygiene</li> <li>Ensure that wash down area is clean and maintained</li> </ul>
All employees and contractors	<ul style="list-style-type: none"> <li>Report any occurrence of noxious weeds to site management</li> <li>Wash all vehicles and equipment before entering or leaving site</li> </ul>

#### 3.1 Training and induction

All employees and contractors entering the site to undertake work activities will be inducted prior to commencing work. This will ensure that they are aware of their obligations under this WMP. Retraining will be undertaken if there are any changes to the procedures outlined in this plan, or if there are any non-conformances to procedures noted by management or external authorities. Records of training will be kept onsite for a minimum of five years.

## 4. Implementation of the weed management plan

The WMP will provide a framework for the control and mitigation of targeted and noxious weeds. The framework will include the coordination of different methods of control to successfully and effectively manage invasive weed species.

### 4.1 Prevention

Prevention is the key to weed management and will be achieved through good hygiene practices and monitoring. Two effective methods for prevention include vehicle and machinery wash down and managing top soil movement.

#### 4.1.1 Vehicle inspection and wash down

Vehicle wash down is a standard control method to decrease the chances of spread through removal of weeds and seeds attached to incoming and outgoing vehicles and machinery. A vehicle wash down area will be established at the entrance to the site and will be designed to allow for capture, containment and drainage of contaminated water and prevent any water from escaping during heavy rainfall. Weed material contained in the wash down area will be disposed of appropriately.

Upon entry to the site, all vehicles will be inspected for the presence of weeds. Vehicles with soil or plant matter detected will be required to undergo a vehicle wash down prior to departure. All machinery and vehicles to be used onsite (i.e. will be accessing areas other than those designated for vehicular traffic) will be washed down on arrival and prior to departure.

#### 4.1.2 Topsoil management

Topsoil has the potential to be a carrier for the seeds and vegetative propagation material of weeds. During the construction phase, topsoil piles will be made in the irrigation block (Figure 1). These topsoil piles will be continually monitored and treated for any weeds that germinate.

### 4.2 Control

The management of weeds will be dependent on the type of weed and the size of infestation. Appendix B describes the control methods recommended by the Northern Territory Government (2015a) for each weed species found on the property on the 12<sup>th</sup> of June 2015. Table 2 provides a summary of the control methods and where they are applicable.

**Table 2 Summary of weed treatment suitability**

Treatment method	Applicable situations
Manual removal (hand pulling/digging out)	Small infestations, where areas may be sensitive to chemical use and where weed species do not have large root systems.
Removal with machinery	Large infestations in areas with predominantly exotic vegetation and no limitations to access.
Chemical control (foliar spray/cut stump/basal bark)	Small-large infestations (multiple species/monocultures) in areas not sensitive to chemical application.
Biological control	Only suitable for some weed species.
Revegetation	Sites where additional native plants are desired

### 4.3 Monitoring and reporting

Monitoring of the site is crucial to ensure that weeds are controlled. The treated areas will be monitored monthly to assess the effectiveness of treatment methods and to remove any regenerating plants. Monitoring will also provide an indication of whether the treatment methods are having an effect on native flora, fauna and livestock. Two comprehensive weed searches of the site will be undertaken in February and November each year, so that treatment may occur in March and December.

The monthly site inspections will be conducted by the Feedmill/Farming Officer (or a skilled delegate), who will report on any non-conformances with this plan and the date and persons involved in the monitoring process. In addition, Feedmill/Farming Officer will ensure that corrective actions are taken within an appropriate time frame to ensure that this management plan is adhered to in future.

In addition, if any Class A weed is found onsite, the ILEF Manager or delegate the Feedmill/Farming Officer will contact the NT Department of Land Resource Management (Weed management branch) to inform them of the weed's location (weedinfo@nt.gov.au or (08) 8999 2380).

### 4.4 Documentation

A wash down log will need to be kept and maintained for a minimum of two (2) years. The log should include:

- Date
- Company
- Driver name
- Model, make and registration of vehicle
- Where the vehicle came from
- Where the vehicle is going
- Who washed and inspected the vehicle and their signatures

A weed control register will be kept for any weeds that have been reported onsite, so that action can be taken. The register should include:

- Date
- Name
- Weed found
- Area found
- Size of infestation
- Action taken
- Person who took action
- Date

A weed treatment record sheet should be completed every time weeds are treated. The sheet should include:

- Date and start and finish time product was used
- Name and address of person who used the product
- Name and concentration of the pesticide used
- Expiry date of the product
- Rate and amount used
- Method of application and equipment used
- Exact location product was used and how big the area was
- Name of target pest
- Weather conditions including temperature and wind speed/direction
- Withholding period

Examples of these documents are available in Appendix D. These documents should be kept for a minimum of two (2) years.

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## 5. References

Northern Territory Government 2014. Weed Management Handbook. Accessible at <http://www.nt.gov.au/weeds>

Northern Territory Government 2015 (a). Alphabetical listing of weeds. Accessible at <http://www.lrm.nt.gov.au/weeds/find>

Northern Territory Government 2015 (b). NR Maps NT. Accessible at <http://www.lrm.nt.gov.au/nrmmapsnt>

The University of Queensland 2013. Weeds of Australia: Special edition of environmental weeds of Australia for Biosecurity Queensland Accessible at <http://keyserver.lucidcentral.org/weeds/keys.jsp>

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## **Appendix A. Characteristics of weed species onsite**

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Weed	Potential environmental/agricultural threats of weeds	Method of dispersion/ spread	Flowering time	Seeding time
<i>Andropogon gayanus</i> (Gamba grass)	Displaces native species through competition for resources. Increases the intensity of late dry season fires to five times that of native grass fires.	Wind, livestock, wildlife, machinery contaminated with seed.	April	May (may also seed after early wet season storms in Oct/Nov)
<i>Sida acuta</i> (Spinyhead sida)	Unpalatable to animals and seeds prolifically, competing with native, pasture and crop plants.	Barbed seeds adhere to animals and clothing, as well as hay and mud attached to vehicles/machinery.	Predominantly Nov-Mar, but may flower throughout the year in favourable conditions	Predominantly from Mar-May, but may produce seed throughout the year in favourable conditions
<i>Senna obtusifolia</i> (Sickle pod)	Toxic to stock and has the ability to grow into a thick monoculture, outcompeting native, crop and pasture plants.	Pods explode, dispersing seeds. Also spread by water, mud, vehicles and machinery. Livestock may consume seeds, which may germinate in the dung.	Mar-Aug	Apr-Sep
<i>Sida cordifolia</i> (Flannel weed)	Unpalatable to animals and seeds prolifically, competing with native, pasture and crop plants.	Barbed seeds are spread by attaching to animals, clothes, hay, mud and vehicles/machinery.	Predominantly Nov-Mar, but may flower throughout the year in favourable conditions	Predominantly from Mar-May, but may produce seed throughout the year in favourable conditions
<i>Azadirachta indica</i> (Neem)	Highly invasive and out competes native species in remnant vegetation and disturbed sites.	Fruit is spread by birds and bats and suckers from the roots.	Sep-Nov	Nov-Apr



Weed	Potential environmental/agricultural threats of weeds	Method of dispersion/ spread	Flowering time	Seeding time
<i>Hyptis suaveolens</i> (Hyptis)	Has the ability to grow into a thick monoculture, outcompeting native, crop and pasture plants.	Bristled fruit is spread by attaching to animals, clothes, hay, mud and vehicles/machinery.	Mar-Aug	
<i>Lantana camara</i> (Lantana)	Toxic to livestock and has the ability to grow into a thick monoculture, outcompeting native, crop and pasture plants.	Spread by vegetative reproduction (grows additional plants from braches that fall on the ground) and also spreads when berries are consumed by birds and other animals.	Throughout the year	Throughout the year
<i>Cenchrus pedicellatis</i> (Annual mission grass)	Out-competes native grasses and herbs, reducing local plant biodiversity. Increases fuel loads, promoting intense, late, dry season fires.	Light, fluffy seeds that are readily dispersed by both wind and water.	Mar-Aug	

**Appendix B. Control Methods Recommended by the Northern Territory Government**

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Weed	Critical period	control	Recommended control method	Potential impacts of negative control method	Mitigation methods	Frequency and timing of monitoring of weed infestation
<i>Andropogon gayanus</i> (Gamba grass)	Nov-Apr flowering)	(before	Chemical treatment is most effective method, as the plant recovers quickly from damage above ground (e.g. fire, slashing and grazing).  - Glyphosate 360g/L is applied as a foliar spray at a rate of 10mL/1L Around water, bioactive glyphosate should be used.	Off target spray may impact surrounding vegetation and fodder crops. Chemical spillage.	Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying. Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.	Monitoring/herbicide treatment should be carried out at least twice a year. Plants should be monitored and treated with herbicide that the beginning of the growing season (November/December) and 4 weeks later to treat any plants that survived. Then again in March to ensure that any new growth does not flower/set seed.
<i>Sida acuta</i> (Spinyhead sida)	Nov-Apr		Chemical treatment is also recommended using one of the following methods:  - Application of 2, 4-d amine 625 g/L as a foliar spray at a rate of 320mL/100L whilst the plant is actively growing (Nov-Apr).-  Application of Metsulfuron-methyl 600g/L as a foliar spray at a rate of 10g/L (requires a wetting agent).  Repeated slashing and cultivation may also be used at other times of the year (Apr-Nov).	Off target spray may impact surrounding vegetation and fodder crops.	Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying. Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.	Due to Spinyhead sida being able to produce year round in the tropics, monitoring/herbicide treatment should be carried out a minimum of twice a year, preferably in December and March.

Weed	Critical period	control	Recommended control method	Potential impacts of method	negative control	Mitigation methods	Frequency and timing of monitoring of weed infestation
<i>Senna obtusifolia</i> (Sickle pod)	Nov-Apr		<p>A combination of herbicide treatment and cultivation of preferable grass is best (slashing and grazing will spread the weed further). Herbicide application options include:</p> <ul style="list-style-type: none"> <li>- Foliar application of Triclopyr 200 g/L and Picloram 100 g/L at a rate of 375mL/100L with a non-ionic wetting agent.</li> <li>- Foliar application of Dicamba 500 g/L at a rate of 500mL/100L with a wetting agent.</li> <li>- Foliar application of Trilopyr 300 g/L and Picloram 100g/L at a rate of 200ml/L with a non-ionic wetting agent.</li> </ul>	Off target spray may impact surrounding vegetation and fodder crops.		Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying. Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.	Monitoring/herbicide treatment should be carried out a minimum of twice a year, preferably in December and March.
<i>Sida cordifolia</i> (Flannel weed)	November to April		<p>Non chemical treatment includes repeated slashing and cultivation of vigorous pasture. Herbicide application includes any of:</p> <ul style="list-style-type: none"> <li>- Foliar application of 2, 4-D amine 625 g/L at a rate of 320mL/100L.</li> <li>- Foliar application of Metsulfuron-methyl 600g/L at a rate of 10g/L with a wetting agent.</li> <li>- Foliar application of Glyphosate 360 g/L at a rate of 15ml/L.</li> </ul>	Off target spray may impact surrounding vegetation and fodder crops.		Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying. Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.	Monitoring/herbicide treatment should be carried out a minimum of twice a year, preferably in December and March.

Weed	Critical period	control	Recommended control method	Potential impacts of method	negative control	Mitigation methods	Frequency and timing of monitoring of weed infestation
<i>Azadirachta indica</i> (Neem)	May is the best time for control, as the plant is actively growing and is not seeding. However, basal bark and cut stump may be used year round, with the most effective time of year being from March to May.		<p>Only chemical control is recommended for Neem:</p> <p>Seedlings &lt;15cm stem diameter:</p> <ul style="list-style-type: none"> <li>- Basal bark application up to 45cm from the ground with Fluroxypyr 333g/L at a rate of 1.8L/100L diesel.</li> <li>- Basal bark application with Triclopyr 240g/L and Picloram 120g/L at a rate of 1L/60L diesel.</li> </ul> <p>Adults &gt;15cm stem diameter</p> <ul style="list-style-type: none"> <li>- Cut stump application with Fluroxypyr 333g/L at a rate of 1.8L/100L diesel.</li> <li>- Cut stump application with Triclopyr 240g/L and Picloram 120g/L at a rate of 1L/60L diesel.</li> </ul> <p>All dead tree material should be disposed of, as Neem can regrow from dropped limbs.</p>	Basal bark method may result in some localised off target spray. However, this application method typically has very little off target damage.		Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying. Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.	Monitoring/herbicide treatment should be carried out a minimum of twice a year, once in May, with a follow up 4 weeks later, and again in October before seeding.

Weed	Critical period	control	Recommended control method	Potential impacts of negative control method	Mitigation methods	Frequency and timing of monitoring of weed infestation
<i>Hyptis suaveolens</i> (Hyptis)	Nov-Apr		<p>Small infestations can be manually removed or the following herbicide applications can be used:</p> <ul style="list-style-type: none"> <li>- Foliar spraying with Glyphosate 360 g/L at a rate of 15mL/1L.</li> <li>- Foliar spraying of 2, 4-D amine 625g/L at a rate of 320mL/100L.</li> </ul>	Off target spray may impact surrounding vegetation and fodder crops.	Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions need to be taken into account. Herbicide preparation will take place in a concreted area with bunding.	Produces seed at 2-3 months of age, so monitoring should be carried out every second month.
<i>Lantana camara</i> (Lantana)	Nov-Apr		<p>Non chemical treatments include bulldozing, stick raking or ploughing, but all plant material should be disposed of. The following herbicide treatments may be used:</p> <ul style="list-style-type: none"> <li>- Foliar spray of Fluroxypyr 200 g/L at a rate of 500ml-1L/100L (higher rate on plants over 1.2m)</li> <li>- Foliar spray of Triclopyr 300 g/L with Picloram 100 g/L at a rate of 350-500ml/100L (higher rate on plants over 1m) with non-ionic wetting agent.</li> <li>- Application of Triclopyr 600 g/L at a rate of 1L/60L diesel via basal bark for plants &lt;5cm stem diameter and cut stump for plants &gt;5cm diameter.</li> </ul>	Off target spray may impact surrounding vegetation and fodder crops.	Use of a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying. Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.	Monitoring/herbicide treatment should be carried out a minimum of twice a year, once in March, with a follow up 4 weeks later, and again in December.

Weed	Critical period	control	Recommended control method	Potential impacts of method	negative control	Mitigation methods	Frequency and timing of monitoring of weed infestation
<i>Cenchrus pedicellatis</i> (Annual mission grass)	Nov-Apr		<p>Non chemical treatment includes slashing prior to seeding. Repeat slashing may be required. As it is an annual, adult plants will not persist the following year. Chemical treatment includes:</p> <p>- Foliar spray of Glyphosate 360g/L at a rate of 10ml/1L during active growth.</p>	<p>Slashing while the plant is seeding will spread the grass. Off target spray from herbicide treatment may impact surrounding vegetation and fodder crops.</p>		<p>Use herbicide rather than slashing if the plant is in seed.</p> <p>Use a buffer zone alongside crops and use of herbicide application nozzles with larger droplet sizes should reduce off target damage. Weather conditions also need to be taken into account when spraying.</p> <p>Herbicide preparation will take place in a concreted area with bunding to reduce contamination risks.</p>	<p>Monitoring/herbicide treatment should be carried out a minimum of twice a year, once in March, with a follow up 4 weeks later, and again in December.</p>

**Appendix C. Weed identification for Declared Weeds Found Onsite  
and on Neighbouring Properties**

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Weeds	Identification
<i>Andropogon gayanus</i> (Gamba grass)	<p>Size: Grass, up to 4m tall by 70cm in diameter.</p> <p>Stems: Thick and covered in soft hairs.</p> <p>Leaves: 30-60cm long by 3cm wide, with a distinctive white midrib and covered with soft hairs.</p> <p>Seed head: Large and branched with flower clusters 4-9 cm long.</p>
<i>Sida acuta</i> (Spinyhead sida)	<p>Size: Herb/small shrub, 30-150 cm tall.</p> <p>Leaves: Yellow-green, elongated in shape, toothed margins and sharply pointed tips.</p> <p>Flowers: 1-2 cm across with five yellow petals (6-9 mm long).</p> <p>Fruit: 2-6 mm across, with 5-8 wedge-shaped segments when mature.</p>
<i>Senna obtusifolia</i> (Sickle pod)	<p>Size: Shrub, grows to 1.5-2.5m high by 1m wide.</p> <p>Leaves: Leaflets are 2 to 3cm long and 1.5 to 2cm wide.</p> <p>Flowers: Yellow, 1cm wide, with five petals.</p> <p>Seed pods: 10-15cm long and 3-5mm wide, with dark brown, shiny, flattened seeds.</p>



*Sida cordifolia*  
(Flannel weed)

Size: Herb/small shrub growing 0.5-2m high.

Leaves: Heart-shaped and hairy, with rounded tips and toothed margins.

Flowers: Yellow or pale orange flowers with five petals (8-10 mm long) that are clustered in upper leaf forks or at the tips of the stems.

Fruit: 3-8 mm wide, with 8-10 wedge-like segments when mature.



*Azadirachta indica*  
(Neem)

Size: Tree growing to 15-20m high

Leaves: Dark green, serrated leaflets, each about 3-8cm long.

Flowers: Cream coloured, perfumed and 1cm wide. Each flower cluster is 15-25cm long comprising 150-250 individual flowers.

Fruit: Yellow when ripe, 1-3cm in diameter, varying in shape from elongate oval to roundish.



*Hyptis suaveolens*  
(Hyptis)

Size: Upright herb to 1.5 m high.

Stems: Square in cross section, hairy and hollow.

Leaves: Hairy, ovate, 2-10 cm long, shallowly toothed, smells minty when crushed.

Flowers: 5-7 mm long pink to lavender coloured tubular flowers arranged in 1-5 flowered clusters.

Fruit: Capsule with 5 lobes.



*Lantana camara*  
(Lantana)

Size: Scrambling shrub to 2-4m in height.

Stems: Square in cross section with small, curved spikes.

Leaves: Bright green, 2–10 cm long and 2–8 cm wide, with round toothed edges.

Flowers: Approximately 2.5cm in diameter with colour varying from pale cream, yellow, white, pink, orange, red, lilac to purple.

Fruits: Green when unripe, purple/black when ripe. Grows in clusters and looks similar to a blackberry.



*Hymenachne amplexicaulis*  
(Olive hymenachne)

Size: Erect grass up to 2.5m high (prefers swampy areas).

Leaves: Blades are 20–35 cm long and 2–3 cm wide, glossy, and bright green with hairy edges. The base of the leaf blade is slightly heart-shaped and clasped around the stem.

Flower: Spike-like and cylindrical, 8 mm wide and up to 40 cm long.



*Jatropha gossypifolia*  
(Bellyache bush)

Size: Thick-stemmed shrub 2.5-4m tall.

Leaves: Young leaves are purple and sticky with 3 rounded lobes. Older leaves are 10 cm in diameter, bright green, with up to 5 lobes, and the edges are covered in coarse, dark brown hairs.

Flowers: 6 to 9 mm wide with red/purple petals and yellow centres, in small clusters throughout the upper part of the plant.

Fruit: Smooth and oval, about the size of a cherry, containing 3 to 4 seeds.



*Cenchrus polystachios*  
(Perennial mission grass)

Size: Grass 30–200 cm tall

Leaves: Blades 10–40 cm long, 3–16 mm wide.

Seed head: Spike-like 3-25cm long and 1.5cm wide.



*Cenchrus pedicellatus*  
(Annual mission grass)

Size: Grass 30-150cm tall.

Leaves: Blades 5-25 cm long, 4-15 mm wide.

Seed head: Spike-like to 19 cm long.



*Salvinia molesta*  
(Salvinia)

Size: Free-floating aquatic fern.

Leaves: Green, paired leaves, covered with water repellent hairs. Young leaves are oval, 12mm across and lie flat on the water. Older leaves become thick and fold at the mid-rib.

Roots: Trail from each pair of young leaves.



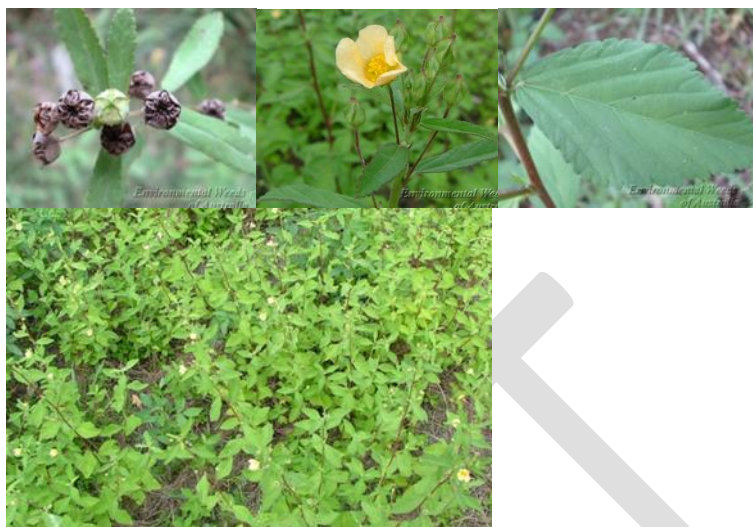
*Sida rhombifolia*  
(Paddy's Lucerne)

Size: Small shrub or woody herb to 1 m tall.

Leaves: Diamond-shaped with irregularly toothed margins.

Flowers: 15-20 mm across yellow to pale orange flowers with five petals.

Fruit: 5-6 mm across, with separate into 8-12 wedge-shaped segments when mature.



*Stachytarpheta  
australis*  
(Branched  
porterweed)

Size: Shrub to 2m tall

Leaves: 10 cm long and 1-5 cm wide, oval-shaped but tapering at the base, with toothed margins.

Flower: 5mm wide, white, pale blue or pale lavender flowers borne along 15-45cm long spikes.



*Themeda  
quadrivalvis*  
(Grader grass)

Size: Grass 1-2.5m in height with cane-like stems.

Leaves: Blades to 60cm in length.

Seed head: 15-60cm long, made up of fan shaped clusters, between leaf-life bracts. Ages from green to golden orange/red colour.



*Stachytarpheta*  
*spp.* (Snake weed)

Size: Shrub to 1.5m high.

Leaves: 10cm long, oval-shaped but tapering at the base, with toothed margins.

Flowers: Borne on 25 cm long flower spike. Flowers are 5mm wide, tubular flowers with five petals. Colour varies from white, dark blue, purple, pink to red.



*Eichhornia*  
*crassipes* (Water  
hyacinth)

Size: Floating waterweed to 65cm tall, with up to 1m long black/purple root system.

Leaves: Round, green, 5-10cm in diameter. Leaf stalks of young plants are swollen, spongy, bulbous structures and mature plants have elongated leaf stalks.

Flowers: Light purple with darker blue/purple and yellow centre, 4-6cm long, 3.5-5cm wide.

Fruit: 10-15mm long.



*Mimosa pigra*  
(Mimosa)

Size: Shrub or small tree to 6m tall

Leaves/stems: Rose-like thorns along stem 5-10mm long. Leaves are bright green, fern-like, 20-25cm long.

Flowers: Round, fluffy, pink, 1-2cm wide.

Seed pods: Clusters of 10-20 thickly-haired seed pods, 6-8cm long.



*Parkinsonia*  
*aculeate*  
(Parkinsonia)

Size: Shrub/small tree 2-6 m in height.

Leaves/stems: Green zig-zagging branches, with long, strap-like, leaves that have large numbers of tiny oval leaflets along the stem. Leaves have a pair of spines (5-20 mm long) at their base.

Flowers: Bright yellow, 2-3 cm across with five petals.

Seed pods: Pale brown, elongated, pods are swollen around each of the seeds.



Photographs and descriptions: The University of Queensland (2013) and Northern Territory Government (2015a).

## **Appendix D. Weed management documentation**

DRAFT





Weed Control Register							
Weed found					Corrective action		
Date	Name	Weed found	Location	Size of infestation	Action taken	Person who took action	Date
<i>E.g.:</i> 27/12/14	<i>Joe Smith</i>	<i>Gamba grass</i>	<i>Along Stuart Highway fence line</i>	<i>5m x 1m</i>	<i>Sprayed with roundup</i>	<i>Joe Smith</i>	<i>1/1/15</i>

Weed treatment record														
Date	Start time	Finish time	Person spraying, Address	Pesticide name	Concentration of pesticide	Expiry date	Rate and amount	Method and equipment used	Location	Weed	Weather			Withholding period
											Temp (°C)	Wind speed	Wind direction	
<i>E.g.: 1/1/15</i>	<i>12pm</i>	<i>12.30pm</i>	<i>Joe Smith 1 Street Address</i>	<i>Roundup</i>	<i>Glyphosate 360g/L</i>	<i>1/1/16</i>	<i>2 litres at 10ml/L</i>	<i>Foliar spray Backpack</i>	<i>Along Stuart Highway fence line</i>	<i>Gamba grass</i>	<i>25</i>	<i>6 km/h</i>	<i>NW</i>	<i>N/A</i>