

**EAST CAPE FARMS (PTY) LTD**

**PROPOSED MINING OF AGGREGATE ON THE  
REMAINING EXTENT OF THE FARM GELUK 104,  
ELLIOT, SAKHISIZWE LOCAL MUNICIPALITY,  
EASTERN CAPE PROVINCE**

**INVASIVE PLANT SPECIES MANAGEMENT PLAN**



**APRIL 2019**

Reference number: EC 30/5/1/3/2/10518MP

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## 1. INTRODUCTION

The applicant, East Cape Farms (Pty) Ltd, applied for environmental authorisation to mine 4.9ha dolerite through excavation and thereafter process the mined mineral through crushing, screening and washing on the farm Geluk 104, which falls in the Sakhisizwe Local Municipality in the Elliot Administrative District, Eastern Cape Province.

The proposed mining permit area is an area extensively disturbed by mining activities. The mining procedure will entail strip mining of the proposed footprint area. The aggregate to be removed from the quarry will be used for road construction in the vicinity. The applicant will:

- Grade the topsoil off a strip. The topsoil will be removed and stockpiled in the immediate area and replaced on a short-term basis to rehabilitate as mining progresses.
- Remove the sand and gravel (where available) from the stripped area to a depth of with an excavator that will load it onto a truck from where it will be hauled from the mining area to the processing plant where it will be processed if required (crushed, screened and washed).
- Weigh the mined material and transport it to clients via trucks and trailers along the existing gravel road connecting the farm with the R56.
- Once the sand and gravel (where available) has been removed from a strip, rehabilitate (replacement of topsoil) the area. Subsequent to the closure of the strip the consecutive area will be opened.
- Mining activities will be limited to daylight hours (07:00 – 17:00 Monday – Saturday) and the proposed activity will not require any blasting.

As mentioned earlier the footprint of the proposed mining permit falls over an area extensively altered by mining, however the area is still covered by vegetation. In the circumstances the removal of vegetation will be necessary to access the minerals.

Control of invasive plant species is an important aspect during all phases of the proposed activities. Therefore, an invasive plant control plan was developed for the site to be implemented during the site establishment-, operational-, decommissioning phase and 24 months' aftercare period of the mining activity.

## 2. OBJECTIVE

The objective of an invasive plants control plan is to provide site management with an implementation tool to control problem plant species that is present or may germinated within the proposed footprint area.

## 3. WHAT IS A PROBLEM PLANT?

According to the book, Problem Plants of South Africa (Bromilow 2001) a weed is a plant in the wrong place at the wrong time. Problem plants are described as vigorous growers that are easily adaptable and mostly exotic or foreign in origin. Weeds usually are pioneer plants that invade disturbed areas such as stockpile areas, overburden and topsoil stockpiles and firebreaks. Invasive plants are plants that have been imported and has the ability to invade the natural vegetation.

The National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004) (NEMBA) came into effect in June 2004 in order to manage and conserve the South African biodiversity within the framework of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA). The Alien and Invader Species (AIS) regulations was subsequently published in terms of section 97(1) of NEMBA in August 2014 and amended in July 2016. The AIS regulations, 2014 grouped plants into four categories and prescribes the subsequent management of each category.

- Category 1a: Invasive species which must be combatted and eradicated. Any form of trade or planting is strictly prohibited.
- Category 1b: Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited.
- Category 2: Invasive species, or species deemed to be potentially invasive that may be grown if a permit is obtained.
- Category 3: Invasive species which may remain in prescribed areas or provinces. Further planting, propagation or trade, is however prohibited.

In order to identify invasive plants that need to be controlled/eradicated from site, the plants specified in these groups must be used as a guideline.

#### 4. WHAT TO DO WITH PROBLEM PLANTS?

Working for Water provides the site manager with an implementation tool to control problem species and keep the site free of invasive plants:

Step 1: Conduct Site Assessment;

Step 2: Set objectives based on resources available and priorities:

- Prioritize management of plants according to the categories stipulated in the AIS regulations.

Step 3: Develop and implement an action plan to achieve objectives:

- The plan must be long term and should include a clearing plan that includes follow up actions for rehabilitation of the cleared area.
- The site plan should include a map showing the areas invested with problem plants.
- Lighter invested areas should be cleared first to prevent the build-up of seed banks, while the control plan works progressively towards the areas with denser stands.
- Educate workers on the species that needs to be eradicated, as well as the specific method to be used.
- Conduct control of invasive plant species.
- Remove plant remains to a suitable disposal area.
- Prevent dispersal of seeds.
- Strive for collective management and planning with neighbors to prevent seed dispersal of problem plants across boundaries.

Step 4: Monitor performance and change actions if necessary

- Conduct monthly inspections to enable early detection of grow back.

#### 5. CONTROL METHODS

The control methods to be implemented on site will depend on the specific problem plants that invaded the site. The best success is generally achieved through a combination of chemical and mechanical control methods with continuous follow-up actions. Site management must take care that the clearing methods used do not encourage further invasion through unnecessary disturbance of soil or naturally vegetated areas. The Department of Water and Sanitation's Working for Water section provides guidelines to the preferred clearing methods for most problem plants. This information can be obtained from their website: <http://www.dwaf.gov.za/wfw/Control/>. The selection of appropriate

methods of control shall be based on the species to be controlled, the size of the plants, the density of the stand, the accessibility of terrain and environmental safety.

The Department of Water and Sanitation proposes that the following methods of control for age or size target plants:

■ Seedlings

Hand pulling or hoeing:

- Hand pulling/hoeing should be carried out in sparse stands.
- Seedlings should be severed below the soil surface or removed from the soil. Soil disturbance should be minimized to reduce re-germination.

Herbicides:

- Herbicides can be used on dense stands.

■ Saplings

Hand pulling or hoeing:

- Where appropriate saplings can be removed manually as described above.

Herbicides:

- Foliar sprays can be carried out depending on the density of the stand. Fan nozzles should be fitted for overall spraying and solid cone nozzles for individual plant treatment. Spraying should be restricted to plants waist high or lower. Ensure there is sufficient foliage to carry the herbicide to the root system.
- Basal stem treatments of suitable herbicides in diesel can be carried out to the bottom 250 mm of the stem. Applications should be by means of a low pressure, coarse droplet spray from a narrow angle solid cone nozzle.
- Cut stump treatments can be used where stems are cut as low as practical. Herbicides are applied in diesel or water as recommended for the herbicide. Applications in diesel should be to the whole stump and exposed roots and in water to the cut area as recommended on the label.
- The application of herbicides should only be sprayed/used on site by a registered pest control officer.

■ Mature Trees (trees above shoulder height or robust bushes 12 – 1 months or older)

Ring Barking:

- Bark must be removed from the bottom of the stem to a height of 0.75 – 1.0 m. All bark must be removed to below ground level for good results.

- Where clean de-barking is not possible due to crevices in the stem or where exposed roots are present, a combination of bark removal and basal stem treatment should be carried out.

Frilling or partial frilling:

- Cuts should be made through the bark into the sapwood by means of a light axe and a suitable herbicide must be applied into the cuts.

Basal stem treatments:

- Suitable herbicides should be applied in diesel to the base of the stem and to any exposed roots. Stems with a diameter up to 50 mm should be treated to a height of 250 mm and stems above 50 mm diameter to a height of 500 mm. This method is only suitable for stems up to 100 mm in diameter.

Cut stump treatment:

- Stumps should be cut as low as practical and the herbicide applied. Applications in diesel should be to the whole stump and exposed roots and in water to the cut area as recommended on the label.

When herbicides are chosen as the preferred control method the guidelines of Working for Water (DWS) as stipulated in the Policy on the Use of Herbicides for the Control of Alien Vegetation must be followed:

- Herbicides selected for control shall be registered for use on that species under the conditions specified.
- Protection of the environment is of prime importance. Riparian areas must be protected and only herbicides that are approved may be used. Washing of equipment or disposal of waste spray mixture is prohibited in or near water courses where contamination of water can occur.
- Empty herbicide containers must be disposed of as hazardous waste and may not be used for any other purpose.
- Equipment must be washed where there is no danger of contamination of a water source or natural vegetated area. It is proposed that washing be restricted to the wash bay.
- Product and spray mixtures should be stored so that it is inaccessible to the public. Site management must ensure that the Safety Data Sheet of the product is available on site.
- The application of herbicides should only be sprayed/used on site by a registered pest control officer.

## 6. SITE SPECIFIC CONDITIONS

As mentioned earlier, the site was used for mining activities. Little vegetation is present on site as seen below.



**Figure 1: Photograph of the proposed mining area**

### **Natural Vegetation:**

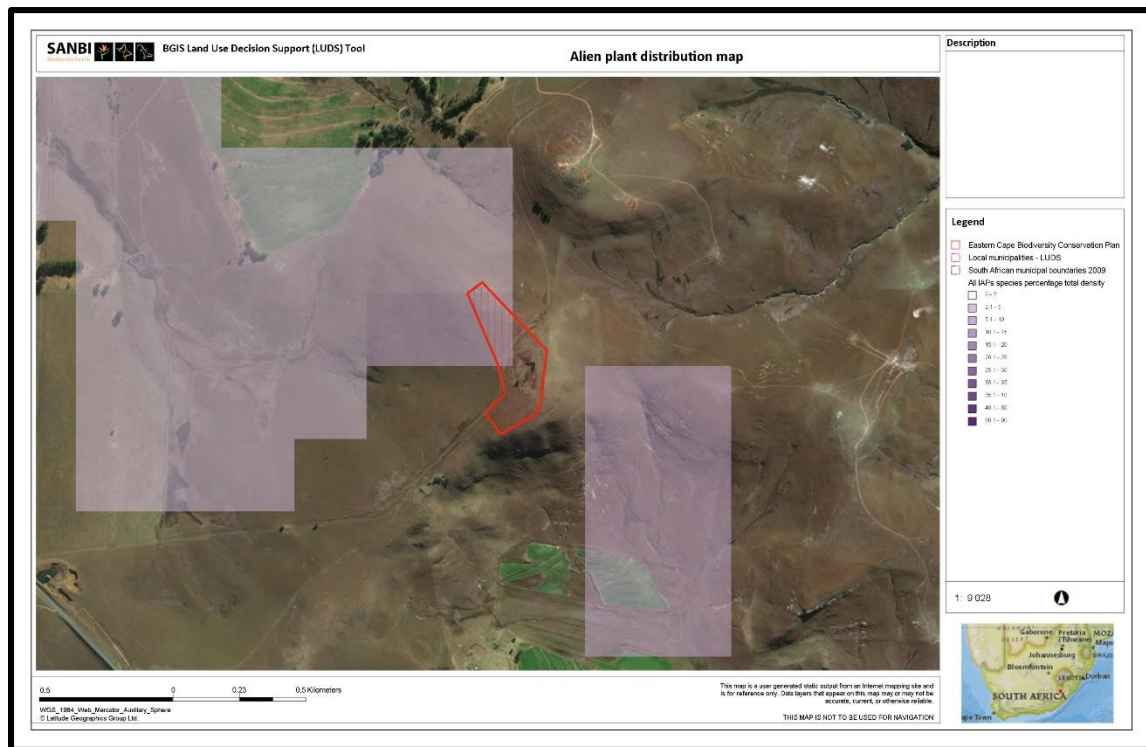
The site falls within the Grassland Biome, within the Southern Drakensberg Highland Grassland vegetation. Moderately rolling and mountainous, much incised by river gorges of drier vegetation types and by forest, and covered in forb-rich grassland dominated by short bunch grasses including *Themeda triandra* and *Tristachya leucothrix*.

No red data or protected plants could be identified in the proposed footprint area of the mining area.

The site earmarked for the proposed mining activity has previously been used for aggregate mining purposes. Although some indigenous vegetation did re-establish through succession the vegetation of the area can be described as disturbed with a high invasion of alien invader plants. According to SANBI GIS (2019), alien vegetation within



the site is low and the distribution density predominantly ranges between 5.1% - 10% and less between 2.5 % - 5% as seen below.



**Figure 2: Alien plants distribution within the Geluk quarry**

In order to prevent the dispersal of the invasive plant species to the less- or non-infected sections of the proposed mining area, site management has to implement a vigilant invasive plant management programme and remove any invasive plants that may germinate within the mining footprint prior to the stripping of topsoil. A combination of the control methods, as prescribed in this plan, must be implemented throughout all the phases of the project.

The entire mining footprint area, in particular the topsoil heaps, must be monitored monthly, for the duration of the operational phase as well as the first 24 months after rehabilitation of the area, to ensure the early detection and control/management of invasive plant species germinating as a result of vegetation removal and soil disturbance.

As everyone isn't familiar with the identification of plant species, photographs of the most important species to be controlled on site was included below for ease of reference.

**7. PROPOSED MANAGEMENT/CONTROL METHODS FOR MOST COMMON INVASIVE PLANT SPECIES**

**NB: THE PROPOSED CONTROL METHODS ARE ONLY RECOMMENDATIONS BASED ON INFORMATION AVAILABLE TO THE ENVIRONMENTAL CONSULTANT AT THE TIME. THE ENVIRONMENTAL CONSULTANTS EMPLOYED AT GREENMINED ENVIRONMENTAL ARE NOT REGISTERED PEST CONTROL OPERATORS (PCO) AND IN THE CIRCUMSTANCES THE SITE SHOULD ENSURE THAT THE EXPERT ADVICE AND OPINION OF A REGISTERED PCO IS SOUGHT PRIOR TO THE COMMENCEMENT AND IMPLEMENTATION OF CONTROL METHODS PERTAINING TO INVASIVE SPECIES.**

**Brazilian Pepper (*Schinus terebinthifolius*)**



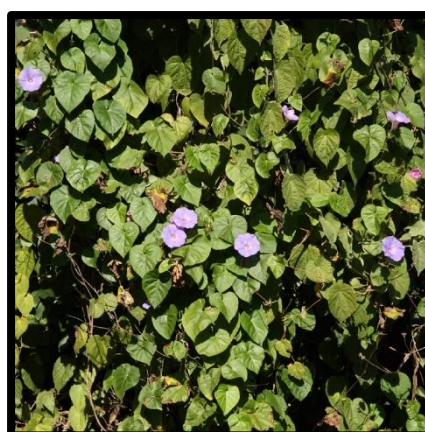
<b>Category:</b>	Existing legislation: CARA 2002 – Category 1 Proposed legislation: NEMBA – Category 1b KwaZulu-Natal, Mpumalanga, Limpopo and Eastern Cape, 3 in rest of South Africa
<b>Description:</b>	General description: A bushy evergreen tree or shrub reaching a height of 6m. Leaves: Dark green and shiny leaves with prominent, pale veins above and paler and smoother below. Flowers: Small creamy white flowers situated in tightly branched terminal clusters appearing from September to March. Fruit/seeds: Fruits are bright red and fleshy spherical drupes containing one seed
<b>Distribution:</b>	KwaZulu-Natal, Mpumalanga, Limpopo and Eastern Cape
<b>Form:</b>	Tree
<b>Origin &amp; Problem:</b>	Brazil in South America. Competes with and has the potential to replace indigenous species. Poisonous and irritant. Indigenous birds could neglect the dispersal of indigenous plants as a consequence of their preference for the fruits of this alien species
<b>Control Measures:</b>	<p><b><u>Mechanical eradication</u></b></p> <ul style="list-style-type: none"> <li>✦ Pull out during seedlings stage (<b>before seed ripens</b>)</li> <li>✦ Disposal of eradicated plants:             <ul style="list-style-type: none"> <li>• Dispose with general waste,</li> <li>• Use in areas prone to erosions,</li> <li>• Dispose of plant material into quarry pit.</li> </ul> </li> <li>✦ If seeds have ripened, pull out plants while making sure seeds do not fall out.</li> <li>✦ Place plants in a black plastic bag and dispose of at an incineration facility to be destroyed.</li> <li>✦ File proof of delivery to the facility.</li> <li>✦ Alternatively, the removed plants can be buried in a trench of at least 1m deep. Grow-back will need to be controlled in this area, preferably with herbicides.</li> </ul> <p><b><u>Herbicides</u></b></p> <p>Apply as specified by supplier</p>
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

**Bugweed (*Solanum mauritianum*)**



<b>Category:</b>	NEMABA - Category 1b
<b>General Description:</b>	Evergreen shrub or small tree growing up to 4m high. Leaves: Leaves are bright green above, paler below, with sharply toothed margins Flowers: Bright yellow, showy, trumpet-shaped flowers in terminal sprays from October to May. Fruit/seeds: Brown, shiny fruit capsules 12-20cm long that split open to release papery winged seeds.
<b>Form:</b>	Shrub
<b>Distribution:</b>	Western Cape, Eastern Cape, KwaZulu-Natal, Mpumalanga, Gauteng, and Limpopo
<b>Origin &amp; Problem:</b>	South America. It competes with and replaces indigenous riverine and forest margin species. Also competes with young trees in plantations, particularly pines and black wattle, inhibiting growth and causing stem deformation. It is a host of the KwaZulu-Natal fruit fly which is an economic pest. It has no fodder value and the plants are generally avoided by grazing animals. The unripe fruits are poisonous and the hairy leaves and stems can cause allergic dermatitis and asthma.
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	Cape honeysuckle ( <i>Tecoma capensis</i> ), yellow bauhinia ( <i>Bauhinia tomentosa</i> ), weeping wattle ( <i>Peltophorum africanum</i> ).

**Common Morning Glory (*Ipomea purpea*)**



<b>Category:</b>	NEMBA – Category 1b
<b>General Description:</b>	Herbaceous twining annual with hairy stems up to 3m or more The bark is brown-grey to blackish, and fissured at the base. Leaves: Bright green, sparsely hairy, heart-shaped leaves. Flowers: Purplish-blue, reddish, magenta or white, sometimes with contrasting stripes, funnel-shaped, to 85mm long; sepals pointed but not long-tapering, 10-15 mm long, bristly at base. Flowers usually appear in November-May, but throughout the year in tropical regions. Fruit/Seeds: Produces globose capsules of 10mm measured across.
<b>Form:</b>	Shrub
<b>Distribution:</b>	Gauteng, Limpopo, Mpumalanga, KwaZulu-Natal and Eastern Cape.
<b>Origin &amp; Problem:</b>	Tropical America. Scrambles over and competes with other species. It is an annual plant and has less impact than the similar <i>Ipomoea indica</i> which is perennial.
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	Indigenous morning glories or large flowered <i>Clematis</i>

**Dalmatian toadflax (*Linaria dalmatica*)**



<b>Category:</b>	1b
<b>General Description:</b>	It looks like a large, yellow snapdragon and has fast-growing, strong, horizontal roots. Leaves: Alternate, pale blue-green, waxy, oval to broadly lance-shaped with pointed tips, 20–60mm long and 20–40mm wide, sub erect, rigid, clasping the stem. Flowers: Golden-yellow with an orange-brown throat, corolla cylindrical, large, 20–50mm long, with a basal spur 4–25mm long, in large, rather loose inflorescences of 10–50 flowers, summer-flowering. Fruit/seeds: Capsule globose, 3–7mm long, seeds wingless.
<b>Form:</b>	Herb
<b>Distribution:</b>	Gauteng, Free State, KwaZulu-Natal, Eastern Cape and Western Cape.
<b>Origin &amp; Problem:</b>	Western Asia and South eastern Europe. It contains an iridoid glycoside, a quinoline alkaloid and a peganine, so it is toxic to livestock such as cattle.
<b>Control Measures:</b>	<p><u>Mechanical:</u></p> <p>Small patches of toadflax can be hand-pulled for five or six years to deplete the energy reserves of the root system. "Pulling or cultivating young Dalmatian and yellow toadflax plants in small infestations before they go to seed will provide control, even eradication, if done consistently for several years. It is important to remove the lateral roots completely, since root fragments can survive to grow new plants. Viable seeds in the soil may continue to germinate for 10 to 15 years.</p> <p><u>Chemical:</u></p> <p>Starane 200 - Fluroxypyr (200g/l)</p> <p>Triclopyr butoxyethyl ester and Triclopyr triethylammonium salt</p>
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. The site will need to be revisited several times per season to completely eradicate these toadflaxes if pulling, plowing or cultivating is used for control."

**Dense-thorned bitter apple (*Solanum sisymbriifolium*)**



<b>Category:</b>	NEMBA – Category 1b – Declared weed. Destroy.
<b>Description:</b>	A very spiny low shrub with many branches up to 1,5m high covered with sticky, glandular hairs and bright orange-red to brown-yellow spines up to 20mm long. It has an extensive root system. The leaves are dull green, hairy, deeply lobed and toothed and have prominent spines on the midrib and veins. White, cream or bluish flowers appear all year. The fruits are shiny green berries turning bright red. The unripe fruit is poisonous.
<b>Form:</b>	Shrub
<b>Distribution:</b>	Western and Eastern Cape, KwaZulu-Natal, Mpumalanga, Gauteng and Limpopo Provinces
<b>Origin &amp; Problem:</b>	Brazil, Argentina, Uruguay and Paraguay in South America. It competes with crop plants and indigenous pioneering species. Poisonous.
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after treatment. Heavily infested areas should be revisited and treated if and as necessary every 6 months.
<b>Replacement Species:</b>	Indigenous, local grass species.

**Exotic brambles (*Rubus spp*)**



<b>Category:</b>	NEMBA – Category 1a and 1b
<b>General Description:</b>	<b>Rubus</b> is a large <a href="#">genus</a> of <a href="#">flowering plants</a> in the <a href="#">rose</a> family, <a href="#">Rosaceae</a> , subfamily <a href="#">Rosoideae</a> . <a href="#">Raspberries</a> , <a href="#">blackberries</a> , and <a href="#">dewberries</a> are common, widely distributed members of the genus. Most of these plants have woody stems with prickles like roses; spines, bristles, and gland-tipped hairs are also common in the genus.
<b>Form:</b>	Shrub
<b>Origin &amp; Problem:</b>	America and Europe. All <i>Rubus</i> spp. are thorny and can form thickets, however, it is only the alien species that form extensive thickets and that cause serious problems in grazing lands, in forestry plantations, and along roadsides.
<b>Distribution:</b>	Western and Eastern Cape, KwaZulu-Natal, Mpumalanga, Gauteng and Limpopo Provinces
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

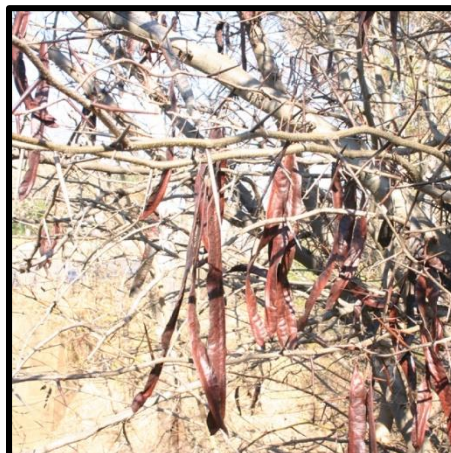


**Himalayan firethorn (*Pyracantha crenulata*)**



<b>Category:</b>	NEMBA Category 1b.
<b>Description:</b>	An evergreen shrub or small tree. It has spiny branches bearing simple leaves. Leaves: It has glossy green leaves up to 5cm long and 8mm wide. Flowers: Flowers are white with five petals and numerous stamens, 8–12mm across, occurring in clusters of 30 flowers along short stems. Fruit/seeds: Fruit is red, orange or yellow and occur along the stems where the flowers were. Berries look like tiny apples, 5–9mm in diameter, and contain seeds. The seeds are brown and irregular in shape, about 2.5mm across.
<b>Form:</b>	Shrub
<b>Origin &amp; Problem:</b>	Western China. The seeds are poisonous if ingested and may result in vomiting.
<b>Distribution:</b>	Mpumalanga, Gauteng, Northern Cape, Limpopo, Free State and Eastern Cape.
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

**Honey locust (*Gleditsia triacanthos*)**



<b>Category:</b>	NEMBA – Category 1b
<b>General Description:</b>	A deciduous, spreading tree 15-20m tall. The trunk and branches have three-branched spines. Bright green bi-pinnate leaves consist of small paired lance-shaped and minutely toothed. Small, yellowish-green flowers appear from October to November. The seed capsules are flat and twisted brown pods.
<b>Origin and problem:</b>	North America. It competes with and replaces indigenous species. Dense stands along watercourses could significantly reduce stream flow
<b>Form:</b>	Tree
<b>Distribution:</b>	Western Cape, Eastern Cape, KwaZulu-Natal, Free State, Gauteng and Mpumalanga
<b>Control Measures:</b>	<u>Mechanical &amp; Chemical:</u> Herbicides are usually required to effectively control trees when cut. Several herbicides have been labelled for honey locust control through various application techniques, including basal bark, thin line basal bark, cut stump, frill or girdle, and foliar applications. However, picloram, one of the most effective herbicides on honey locust, is not labelled for individual basal bark or cut stump treatment in grazed pasture. Aminopyralid recently received a new label addition for individual tree treatment of honey locust in grazed pasture.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

**Kikuyu grass (*Pennisetum clandestinum*)**



<b>Category:</b>	NEMBA – Category 1b in protected areas and wetlands in which it does not already occur
<b>Description:</b>	A rhizomatous grass with matted roots and a grass-like or herbaceous habit. It is a prostrate perennial, which may form a loose sward up to 46cm high when ungrazed, but under grazing or mowing, it assumes a dense turf. The grass spreads vigorously from rhizomes and stolons, which root readily at the nodes and are profusely branched.
<b>Form:</b>	Grass
<b>Distribution:</b>	Gauteng, KwaZulu-Natal, Eastern Cape, Mpumalanga, Limpopo and Free State.
<b>Origin &amp; Problem:</b>	East Africa. Kikuyu grass forms a thick mat that crowds out desirable species. On golf courses it often invades greens.
<b>Control Measures:</b>	<u>Chemical:</u> Taskforce at 0.56 and 0.75 kg/ha for mature grass <u>Mechanical:</u> Physical removal of the plants, including the underground parts. This should be done when not seeding. If seeding then the seed heads should be carefully removed and burnt.
<b>Monitoring Measures:</b>	Photographic records should be kept and photographs taken on each site visit in areas of heavy infestation. Sites will need to be revisited, monthly to cut back and re-growth. With the removal of plants soils may become exposed and should be re-vegetated with grasses or indigenous species, mentioned below.
<b>Replacement Species:</b>	<i>Themeda triandra</i> <i>Melinis repens</i>

**Midnight lady (*Harrisia pomanensis*)**



<b>Category:</b>	1b
<b>Form:</b>	Succulent
<b>Distribution:</b>	Western Cape, Eastern Cape, KwaZulu-Natal, Mpumalanga, northern Gauteng and Limpopo
<b>General Description:</b>	Midnight lady is a perennial with spiny, fleshy-jointed stems. The stems are ribbed lengthwise with six ribs. Leaves are small, insignificant and deciduous and are reduced into spines. Flowers: The large, showy flowers (15-20cm long) are borne singly along the stems. They consist of many white or pinkish petals that are fused together into a tube at the base. Fruit/seeds: The fleshy fruit are bright red when mature and almost rounded in shape. These fruit (2-6cm across) are covered in small swellings (areoles) on which groups of 3-5 spines are sometimes borne.
<b>Origin &amp; Problem:</b>	Southern South America. It forms dense infestations that reduce pastures by choking out other pasture species. The spines interfere with stock mustering and movement, and cause injuries and lameness to stock.
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic evidence should be kept and photographs taken on each site visit in areas of heavy infestation.

**Moon cactus (*Harrisia martini*)**



<b>Category:</b>	Category 1 NEMBA – Category 1b
<b>Form:</b>	Succulent
<b>Distribution:</b>	Western Cape, Eastern Cape, Free State, KwaZulu-Natal, Gauteng and Limpopo
<b>General Description:</b>	Spiny, succulent shrub 1-3m high with long, much-branched stems often arching downwards and rooting where they touch the ground. Spines in groups, with one or two central spines much longer than the others. No leaves. Showy white nocturnal flowers appear from November to January. Bright pinkish-red, succulent berries
<b>Origin &amp; Problem:</b>	South America (Argentina). Competes with indigenous species. In savanna it grows under the crowns of trees, thus barring access to shade for domestic and wild animals. Where it has started forming infestations it reduces the carrying capacity of the land and its many spines can cause injuries to grazing animals Spines cause irritation to skin.
<b>Control Measures:</b>	<u>Biological:</u> Biological control is the preferred control option, and two biocontrol agents are available in South Africa. They are a mealybug, <i>Hypogeococcus festerianus</i> that causes stunted and distorted growth before eventually killing the plant, and a long-horn stemborer, <i>Nealcidion cereicola</i> , which tunnels in the stems and also has the potential to kill the plant.
<b>Monitoring Measures:</b>	Photographic evidence should be kept and photographs taken on each site visit in areas of heavy infestation.
<b>Replacement species:</b>	Basuto kraal aloe ( <i>Aloe tenuior</i> ), climbing aloe ( <i>Aloe ciliaris</i> )

**Moth catcher (*A raujia sericifera*)**



<b>Category:</b>	NEMBA – Category 1b
<b>Form:</b>	Shrub
<b>Distribution:</b>	Eastern Cape, KwaZulu-Natal, Western Cape, Free State, Gauteng and Mpumalanga
<b>General Description:</b>	A vigorous climber with milky sap growing to 5m or higher. Leaves are dark green and smooth above and pale green or whitish below with short, dense hairs. White, cream or pale pink flowers appear from November to April. Green, spongy fruits which turn brown and woody and split to release numerous blackish seeds. Poisonous, causing skin irritation
<b>Origin &amp; Problem:</b>	South America. Overtops and smothers other species and produces poisonous milky latex and seeds.
<b>Control Measures:</b>	<u>Mechanical:</u> Physical removal of the plant. Remove as much root as possible. Fast grower! Do not allow to bear fruit
<b>Monitoring Measures:</b>	Photographic evidence should be kept and photographs taken on each site visit in areas of heavy infestation.
<b>Replacement Species:</b>	Traveller’s joy ( <i>Clematis brachiata</i> ), flowering ivy ( <i>Senecio macroglossus</i> ), starry wild jasmine ( <i>Jasminum multipartitum</i> ).

**Oleander (*Nerium oldeander*)**



<b>Category:</b>	NEMBA – Category 1b
<b>Description:</b>	An evergreen shrub or small tree growing up to 6m high. Leaves: Dark, dull-green elongated leaves that are paler below with distinctive veins and a prominent midrib. Flowers: Pink, red or white flowers that are slightly aromatic with a single row of petals appearing from September to March. Fruit/seeds: Bears reddish-brown fruit follicles which are finger-like and 10-20cm long. <i>Oleander plants contain several toxic elements, including cardiac glycosides, saponins, digitoxigenin, oleandrin, oleondroside, nerioside and other unknown toxins.</i>
<b>Form:</b>	Tree
<b>Distribution:</b>	Eastern and Western Cape, KwaZulu-Natal and Mpumalanga.
<b>Origin &amp; Problem:</b>	Mediterranean. Competes with indigenous species. All parts of the plant are highly toxic and lethal to humans, birds and other animals.
<b>Control Measures:</b>	<u>Mechanical:</u> Physical removal of plant. Plant is very toxic, as such safety gear is recommended when removing plant. Do not burn oleander trimmings. The plant's toxins are carried aloft by smoke.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	September bush ( <i>Polygala myrtifolia</i> ), Pride-of-de-Kaap ( <i>Bauhinia galpinii</i> ), dune poison bush ( <i>Acokanthera oblongifolia</i> ).

**Pampas grass (*Cortaderia selloana*)**



<b>Category:</b>	Category 1b b. Sterile cultivars or hybrids are not listed.
<b>Form:</b>	Grass
<b>General Description:</b>	A robust, tussock grass growing up to 3,5m in diameter with flowering stalks reaching 4m high. Leaves: Long slender leaves with narrowly tapering tips and grey or bluish-green in colour, often v-shaped in cross-section with rough margins. Flowers: Feathery silvery-white to pink or mauve flowers appearing from February-April. Fruit/Seeds: Produces from an open panicle, containing a large number of seeds.
<b>Distribution:</b>	Western Cape, Eastern Cape, KwaZulu-Natal and Gauteng
<b>Origin &amp; Problem:</b>	South America (Brazil, Uruguay, Paraguay, Argentina and Chile. It forms large clumps which displace smaller indigenous species.
<b>Control Measures:</b>	<u>Mechanical:</u> Physical removal of the plants is effective if they are small enough. <u>Chemical:</u> Herbicides have been recommended (Amino triazol and dalapon) but the contractor should take serious precaution before using.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	East coast broomgrass ( <i>Miscanthus capensis</i> ), riverbed grass ( <i>Pennisetum macrourum</i> ), Cape thatching grass ( <i>Chondropetalum tectorum</i> ), papyrus ( <i>Cyperus papyrus</i> )



**Parrot's feather (*Myriophyllum aquaticum*)**



<b>Category:</b>	NEMBA – Category 1b
<b>Description:</b>	A spirally leaved, aquatic plant capable of forming dense infestations in waterways with pale green, finely divided, feather-like leaves arranged in whorls. Tiny, solitary, inconspicuous cream flowers forming in the axils of the leaves from May-September. Leaves: Pale green, finely divided, feather-like and arranged in whorls. Flowers: Tiny, solitary, inconspicuous cream flowers forming in the axils of the leaves from May-September. Fruit/Seeds: Does not produce fruits
<b>Form:</b>	Tree
<b>Distribution:</b>	Western Cape, Eastern Cape, KwaZulu-Natal, Gauteng, Mpumalanga and Limpopo Province
<b>Origin &amp; Problem:</b>	South America. It invades still or slow-moving water on the banks of rivers, lakes and ponds.
<b>Control Measures:</b>	<u>Mechanical:</u> Raking or seining it from the pond, but it will re-establish from any remaining fragments and roots. <u>Chemical:</u> Herbicide: Use Imazapyr, Triclopyr butoxyethyl ester and Triclopyr triethylammonium salt
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	Creeping ludwigia ( <i>Ludwigia stolonifera</i> ), Water parsnip ( <i>Sium repandum</i> ), water chestnut ( <i>Trapa natans</i> )

**Pereskia (*Pereskia aculeate*)**



<b>Category:</b>	NEMBA – Category 1b
<b>Description:</b>	Spiny, clambering vine with long slender branches, growing 2-10m or higher and resembling bougainvillea. Young stems and leaves semi-succulent with pairs of short, hooked spines in the leaf axils. The older stems are woody with clusters of hard, straight spines 30-40mm long. Leaves: Bright green to yellowish, lance-shaped leaves. Flowers: White, cream or yellow flowers appearing from March-July and lemon-scented. Fruit/Seeds: Succulent berries about 20mm across, initially green then turning yellow.
<b>Form:</b>	Shrub
<b>Distribution:</b>	Mostly in the Eastern Cape and KwaZulu-Natal, as well as scattered parts of Gauteng, Mpumalanga and Limpopo Provinces
<b>Origin &amp; Problem:</b>	West Indies and South America (Brazil and Argentina). It overtops and smothers other species, including large forest and plantation trees. Obstructs access to forests and plantations.
<b>Control Measures:</b>	<i>Biological: A new potential biocontrol agent for Pereskia aculeate, Catorhintha schaffneri (Correidae) was subjected to host specificity testing.</i>
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

**Pompom Weed (*Campuloclinium macrophalum*)**



<b>Category:</b>	Existing legislation: CARA 2002 – Category 1 NEMBA – Category 1b
<b>Distribution:</b>	Grassland regions of Gauteng, Kwazulu-Natal, Limpopo, Mpumalanga and the Eastern Cape Provinces
<b>General Description:</b>	A tall erect perennial herb with pink fluffy flower heads and leaves concentrated on the base of the plant. Bark: Green to purple covered with rough bristly hairs. Leaves: Light green with serrated margins and lance-shaped, becoming small and more distant upwards. Flowers: Pink and are produced in dense clusters at the end of aerial stems, flower-head consists of hundreds of tiny, star shaped florets surrounded by purple bracts. Flowers in late summer during December-March. Fruit/Seeds: Brown, one-seeded achenes.
<b>Origin &amp; Problem:</b>	Central and South America (Mexico to Argentina). It causes serious degradation of the veld, lowering the biodiversity and reducing the grazing capacity by being unpalatable to large herbivores.
<b>Form:</b>	Weed
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

**Red sesbania (*Sesbania punicea*)**



<b>Category:</b>	Category 1 NEMBA – Category 1b
<b>Form:</b>	Shrub
<b>Distribution:</b>	Found in all provinces of South Africa.
<b>General Description:</b>	A deciduous shrub or small tree growing up to 4m in height and has numerous slender branches. Leaves: Dark green, drooping, 100-200mm long, paired leaflets. Flowers: Red or orange flowers appear in dense sprays up to 25cm long from September to March. Fruit/seeds: Distinctive four-winged oblong brown pods 60-80mm long.
<b>Origin &amp; Problem:</b>	South America. Competes with and replaces indigenous riverine and wetland species. Poisonous, especially the seeds, which are lethal to birds, mammals and reptiles.
<b>Control Measures:</b>	<p><u>Mechanical:</u> Hand pulling: Can remove seedlings and young plants.</p> <p>Cutting: Cut to ground level in Spring before it flowers will reduce the number of seeds produced and will deplete the plants energy reserves.</p> <p><u>Biological (only in South Africa – beetles that have been successful biological agents since 1980):</u> <i>Trichapion lativentre</i>, a bud-feeding weevil that feeds on the leaflets as adults and develops within the flower buds as larvae; <i>Rhyssomatus marginatus</i>, a weevil whose larvae destroy the ripening seeds within the pods and whose adults feed on the leaves, flowers and meristems of the plants; and <i>Neodiplogrammus quadrivittatus</i>, a large stem-boring weevil whose larvae tunnel in the stems and branches causing structural damage, especially to vascular tissues, which eventually kills the plants.</p> <p><u>Chemical:</u> Triclopyr - Rate: Foliar treatment: 0.5% v/v solution of Garlon 4 Ultra to thoroughly wet all leaves. Cut stump treatment: 0.5 to 1.5% Garlon 4 Ultra v/v in water, or 3% Garlon 3A v/v in water. Pathfinder II is a ready to use formulation. Timing: Apply when plants are growing rapidly. Imazapyr - Rate: Cut stump treatment: 2% v/v solution of Habitat. Timing: Best when used in late summer to early fall, but before leaf drop.</p>
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required.
<b>Replacement Species:</b>	Dwarf coral tree ( <i>Erythrina humeana</i> ), September bush ( <i>Polygala myrtifolia</i> ), purple broom ( <i>Polygala virgata</i> ), wild pomegranate ( <i>Burchellia bubalina</i> )

**Spear/Scotch thistle (*Cirsium vulgare*)**



<b>Category:</b>	NEMBA – Category 1b – Declared weed. Destroy.
<b>Form:</b>	Herb
<b>General Description:</b>	Spiny, herbaceous biennial which forms a large, flat rosette of leaves and a deep tap root in the first year and numerous branched stems up to 1,5m high in the second year. Stems have spiny wings. Dark green leaves with stiff hairs above and white woolly beneath. Pink to mauve thistle-like flowers surrounded by spiny bracts appear from September to April. This plant invades grassland, roadsides, vlei and dam margins and river banks in cool, high rainfall areas.
<b>Origin &amp; Problem:</b>	Europe, Asia and North Africa. It causes heavy infestations that reduce the carrying capacity of the veld and can cause injury to man and animals.
<b>Distribution:</b>	Common throughout the Eastern Cape, KwaZulu-Natal, Gauteng, Mpumalanga, Limpopo and North West Provinces
<b>Control Measures:</b>	<u>Chemical:</u> Herbicides containing picloram are affective against seedlings. <u>Mechanical:</u> Physical removal of plants prior to seeding. Removal of seed heads prior to seeding.
<b>Monitoring Measures:</b>	Photographic evidence should be kept and photographs taken on each site visit in areas of heavy infestation. Sites will need to be revisited monthly (more frequent if necessary) to cut back stems that are starting to flower and for any re-growth. With the removal of plants soils may become exposed and should be re-vegetated with grasses or indigenous species of the genera below.
<b>Replacement Species:</b>	<i>Ceratotheca triloba</i> <i>Vernonia sp.</i>

**Spiked water milfoil (*Myriophyllum spicatum*)**



<b>Category:</b>	Category 1 NEMBA – Category 1b
<b>Form:</b>	Grass
<b>General Description:</b>	Spiked water milfoil is a submerged aquatic plant that can rapidly take over a pond, lake or area of slow-moving water. It creates dense mats of vegetation that shade out other indigenous aquatic plants, diminish habitat and food resources valuable for fish and birds, and decrease oxygen levels in the water when the plant decays.
<b>Distribution:</b>	All provinces except Free State.
<b>Origin &amp; Problem:</b>	North America, Europe, Asia and North Africa. Spiked water milfoil forms dense, submerged masses which disrupt recreational activities and threaten aquatic ecosystems and irrigation schemes.
<b>Control Measures:</b>	<u>Mechanical:</u> Mechanical control – Spiked Water Milfoil responds well to mechanical control methods. To prevent deoxygenation it is essential that the cut material is removed from the water. Once cut or raked the weed can be removed to an area away from the side of the water and placed in small piles to decompose. If being left to decompose close to the water bank then great care must be taken to ensure that no rotting liquid can seep back into the water. Our amphibious weed harvester can effectively cut and remove this weed from your water body.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement species:</b>	Water hornwort ( <i>Ceratophyllum demersum</i> )

**Spreading century plant (*Agave Americana*)**



<b>Category:</b>	Category 3 in Western Cape and Not listed elsewhere.
<b>General Description:</b>	Succulent shrub with a basal rosette of thick, heavy leaves up to 2 m high; suckers from the base; flowering pole 5-9 m tall. Leaves light grey, with toothed margins and terminal spine; leaves reflexed (as opposed to unreflexed in variety <i>expansa</i> ); variegated forms have grey to dark green leaves with yellow or white margins and a central stripe.
<b>Form:</b>	Shrub
<b>Distribution:</b>	Western Cape, Eastern Cape, KZN, Free State, Northern Cape, Limpopo, and Mpumalanga.
<b>Problem &amp; Origin:</b>	Mexico. The plant eventually forms dense almost impenetrable thickets and has properties that can cause injury to people and animals.
<b>Control Measures:</b>	<u>Mechanical:</u> Small infestations of <i>A. americana</i> can be controlled by digging out small plants manually. Large plants can be moved by machinery. Care should be taken to dig out the taproot to prevent spread by suckering, and all pieces need to be disposed of properly.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.

**Tree-of-hell (*Ailanthus altissima*)**



<b>Category:</b>	CARA 2002 – Category 3 NEMBA – Category 1b
<b>General Description:</b>	A fast growing tree from China which can grow to 20m or more. It has smooth stems with pale grey bark, and twigs which are light chestnut brown, especially in the dormant season. Bark: Grey, smooth or scaly bark. Leaves: Dark green leaves, with yellowish autumn tints that give off an unpleasant odour when crushed. Flowers: Greenish-yellow flowers, in large terminal sprays, from October to November. Fruit/seeds: Papery winged fruit, tan pink-coloured.
<b>Form:</b>	Tree
<b>Distribution:</b>	Western Cape, Eastern Cape, Free State, KZN, Mpumalanga and Gauteng.
<b>Problem &amp; Origin:</b>	China. Competes with and has the potential to replace indigenous species.
<b>Control Measures:</b>	<u>Mechanical:</u> Seedlings & saplings: Hand pull. All plants: Cut close to ground.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	Wild plum ( <i>Harpephyllum caffrum</i> )



**Yellow bells (*Tecoma stans*)**



<b>Category:</b>	1b
<b>Description:</b>	Evergreen shrub or small tree growing up to 4m high. Leaves: Leaves are bright green above, paler below, with sharply toothed margins Flowers: Bright yellow, showy, trumpet-shaped flowers in terminal sprays from October to May. Fruit/seeds: Brown, shiny fruit capsules 12-20cm long that split open to release papery winged seeds.
<b>Form:</b>	Tree
<b>Distribution:</b>	Eastern Cape, KwaZulu-Natal, Mpumalanga, Gauteng, Limpopo Provinces
<b>Origin &amp; Problem:</b>	Mexico and Texas, Arizona and New Mexico in the United States. Competes with and has the potential to replace indigenous species. Can invade hot and dry savanna where it may reduce grazing for domestic and wild animals.
<b>Control Measures:</b>	Mechanical removal is advised.
<b>Monitoring Measures:</b>	Photographic records should be kept of infested areas and should be taken at each visit. Re-growth should be monitored 2 and 4 months after chemical application and treated as required. Heavily infested areas should be revisited and treated if and as necessary at least every 6 months.
<b>Replacement Species:</b>	Cape honeysuckle ( <i>Tecoma capensis</i> ), yellow bauhinia ( <i>Bauhinia tomentosa</i> ), weeping wattle ( <i>Peltophorum africanum</i> ).

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