

**INVASIVE ALIEN & PROBLEM PLANTS ON
THE WITWATERSRAND & MAGALIESBERG.**

Field Guide

by Karin Spottiswoode



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Cover photograph: Extended Public Works Program workers showing Lantana rootstock they have pulled out with the aid of tree poppers in Kloofendal Nature Reserve.

Disclaimer

This book is intended as a guide only.

- For more detailed information on the various plants, please consult Lesley Henderson's guide "Alien Invasive Plants in South Africa, 2020 edition published by the Agricultural Research Council, and Clive Bromilow's book "Problem plants and Alien Weeds of Southern Africa", 2018 edition. Government information on invasive plants can be found on www.invasives.org.za.
- Some people may have allergic reactions to certain plants, so anyone working on alien invasives should wear suitable personal protective equipment (PPE) and consult their doctor as required.
- Use of tools and herbicides is at one's own risk.

Non-compliance

If declared Alien Invasive Plants (AIP) are present in somebody's property, the owner is responsible for removing those plants. A non-compliance form should be issued against the landowner. Information on the non-compliance application can be obtained from Stiaan Kotze from dept of Forestry, Fisheries and the Environment (DFFE) cell 082-447-4077, email skotze@dfue.gov.za.

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Introduction

This booklet is based on declared alien invasive plants and other problem invasive plants found in the Kloofendal Nature Reserve, which is in the western part of Johannesburg, and in the Magaliesberg mountains.

As part of the Friends of Kloofendal, which was founded in August 2002, I have been very involved in the control of Alien Invasive Plants (AIPs) in Kloofendal Nature Reserve for many years, supported by Johannesburg City Parks management of the reserve, members of the Friends of Kloofendal, other volunteers, students, scout groups and EPWP workers employed by Johannesburg City Parks & Zoo. This booklet was started as an aid towards teaching volunteers and workers how to identify the Alien Invasive Plants inside the Kloofendal Reserve and distinguish them from similar looking indigenous plant species.

I have compiled this booklet on identification and control of AIPs with the aid of experts as well as various people working on AIPs elsewhere in Johannesburg.

I have been reluctant in the use of herbicides as they do have an impact on life of plants, animals (insects) and fungi close to the AIP to be targeted. Our methodology in removal of AIPs since November 2020 has been mechanical in the form of simply pulling out small plants where possible and using tree poppers for bigger plants. Trees too big for removal by a tree popper have been sawn or cut down, bark stripped down to the roots if single-stemmed. Multiple-stemmed trees simply cut down, with a two monthly follow-up cutting away regrowth – a few of such follow-ups are required for the tree to be starved and die. Alternatively, we use paint-on herbicide on cut multi-stemmed trees.

Mechanical control is a big task but, judging by the mixed success seen in previous use of herbicides in AIP control, the mechanical method looks more effective and is far less harmful to the natural environment.

In a four months AIP control project starting in November 2020, and subsequent AIP control work in Kloofendal, a daily record was kept of the different species and number of plants removed of each species and their location in the reserve, initially in recording books.

These records were then transferred onto a spreadsheet for data processing. Since 2022 recording is done on a GPS App on the cell, and then exported via email to a spreadsheet for data processing which gives numbers of AIPs pulled out, ringbarked or treated with paint-on herbicide, date and time, with location on the Kloofendal map, an overlay for each species. This is a new technology we are developing for record keeping of work done.

As many species all like to grow in the same disturbed area, it is more efficient to work on all of them in an area rather than just focusing on one species.

Removing AIPs does not only involve removing the plants, rootstock and all where possible, but also removing the fruit with the seeds when they have been formed.

My report on work done November 2020 into 2021, which includes Colleen van Rooyen's contribution in recording location of AIPs in Kloofendal, can be accessed at

<https://kloofendalfriends.org.za/alien-invasive-plant/>

This booklet includes the South African declared AIPs, as well as non-declared invasive problem plants occurring in the Kloofendal Nature Reserve. I have included some AIPs which do not occur in Kloofendal but do occur in other Johannesburg green areas such as Klipriviersberg Nature Reserve and in the Magaliesberg.

Functions of this book

1. Create awareness for the need of AIP control, what harm is caused by AIPs invading our natural environment and Johannesburg in general.
2. Identification of AIPs and indigenous problematic invaders and encroachers in Kloofendal Nature Reserve, other natural similar areas in Gauteng and the Magaliesberg and in one's own properties.
3. Identification of AIPs needs to be done out in the field. The Kloofendal Nature Reserve could be used as a training venue.
4. Learn about methodologies used in removing the AIPs with minimal damage to the natural environment.
5. Learn about record keeping of plants removed, where and when, this also allows for observing productivity of workers and allows for a management plan for present and future work to be done, including the necessary follow-up, checking up how effective the AIP removal has been, and to continue cutting away new growth and pulling out AIPs where possible.
6. Assist in an AIP management plan for Johannesburg.
7. With the aid of knowledge and experience gained in training, create jobs in AIP control work in Gauteng and Northwest province.

What is the problem with AIPs?

1. It is against the law (NEMBA AIS Regulations – see below)
2. AIPs replace our indigenous vegetation, sometimes in a big way! Alien invasive species, which includes plants, animals and other organisms, are responsible for a quarter of South Africa's indigenous biodiversity loss.



(3)

Pompom weed, *Campuloclinium macrocephalum*, invading grassland.

3. AIPs take up a lot of water. Research has shown significant current water losses due to the impact of alien invasive plants. It is estimated that the Western Cape Water Supply System (WCWSS) currently loses about ±38 million m³/annum through these impacts (equivalent to the capacity of Wemmershoek Dam).
4. AIPs often grow into big trees, thereby consuming extra lots of water, as compared to our indigenous plants which mostly do not tend to get as big e.g. Black Woods, mature Black and Silver Wattle trees, Eucalyptus trees, Pine trees etc.
5. Riparian invasions use water in rivers and use can exceed the rainfall. Dense black wattle (*Acacia mearnsii*) invasion is estimated to result in a 90–100% reduction in annual river flows (3).
6. AIPs are often poisonous, unpalatable, dangerous to animals and plants, such as *Cestrum parqui*, *Datura stramonium*. Ripe fruits and seeds of some AIPs might be palatable to birds or insects, aiding in the AIP's seed dispersal.

7. AIPs are very good at invading natural areas, through a suckering system, multiple seed production, nesting close to indigenous plants while small, which offers the AIPs protection from the elements such as sun, providing shade from the drying-out, protection from wind, frost, fire, and then overtaking these indigenous host plants once AIPs are big.
8. The AIP roots can be intertwined with the indigenous plant roots (Lantanas do that), competing with the indigenous plants for water and minerals in the ground, and with fungi and small creatures (eg termites) essential for plants to grow.
9. AIPs can make the soil and water in which they grow unsuitable for indigenous plants to grow there (exuding germination or growth inhibitors substances from their roots into the ground and water – e.g. Black Wattle and Silver Wattle) a useful technique, called Allelopathy, which allow the AIPs to eliminate competition from their neighbouring indigenous plants.
10. AIPs have strong defence mechanisms making eradication difficult e.g. Lantana thorns, Pyracantha spines, *Cestrum parqui*'s poisonous fumes and sap, allergic reaction caused by hairs on Bugweed, plentiful seeds such as Pompom weed, non-declared invaders such as Amaranthaceae and Boraginaceae family have multiple burry seeds which make work on AIPs in disturbed areas very difficult.
11. Suckering – shoots arising from the roots of a woody plant, often some distance away from the main stem. (1)
12. Coppicing – regrowth from a stump or stem that has been cut (1), such as Black Wood (*Acacia melanoxylon*).
13. AIPs do well in disturbed ground which is very common in human populated areas, where ground is disturbed by usage, fences, paving, buildings, gardening.

Ornamental Invaders

Plants having been brought from other countries for gardening purposes, because they look beautiful, having become invaders, when escaping from gardens. Their propagation is made worse by horticulturalists promoting these exotic plants over the indigenous ones (1).

Indigenous Bush Encroachment

In certain conditions, mostly overgrazing, indigenous vegetation increases in such a density that virtually all other vegetation is excluded, drastically reducing number of game to almost zero and making carrying capacity of domestic stock totally uneconomical (1). In Kloofendal the bush encroachment is due to lack of fire, which is a natural phenomenon on the Highveld.

Examples of indigenous Bush encroachers in the reserve are:

Diospyros lycioides

Lippia javanica

Leucosidea sericea

Lopholaena coriifolia

Senegalia caffra *Acacia caffra*)

Tarchonanthus camphoratus



(7)

Diospyros lycioides



Lippia javanica (7)



Lopholaena coriifolia (95)



Leucosidea sericea



(7)

Senegalia caffra / Acacia caffra



Tarchonanthus camphoratus (7)

NEMBA AIS Regulations

National Environmental Management: Biodiversity Act

AIS – Alien Invasive Species

Law passed in 2014, updated in 2020

Listed invasive species are assigned to four categories:

Category 1a:

Species which must be combatted or eradicated

Category 1b:

Species which must be controlled

Authorized officials must be permitted to enter properties to monitor, assist with or implement the control of listed species

Any **Category 2** listed species (where permits are applicable) which fall outside of containment and control, revert to Category 1b and must be controlled.

Any Category 3 listed species which occur within a Protected Area or Riparian (wetland) revert to Category 1b and must be controlled.

Category 2:

Any species listed under Category 2 requires a permit issued by the Department of Forestry, Fisheries and the Environment (DFFE) to carry out a restricted activity ([See Permit Applications.](#))

Category 3:

Category 3 listed invasive species are subject to certain exemptions in terms of section 70 (1)(a) of the NEMBA Act, which applies to the listing of alien invasive species.

Any Category 3 listed plant species that occurs in riparian areas, must be considered as Category 1b and the appropriate control measures instituted.

Recommended methodology on removing AIPs

Based on experienced gained on work done in Kloofendal Nature Reserve and Magaliesberg over many years.

1. Wear clothing that does not attract burs such as Forget-me-not seeds, Black jacks, Burweed, grass seeds, so do not wear -stretchy material, nor knitted clothing. It is recommended to wear gaiters to cover socks and shoelaces. Hair to be covered by a hat, braids and loose hair to be tied back and covered by a hat. Suncream is recommended, as well as bringing something to drink.
2. Welding gloves (elbow high, thick leather gloves, usually blue) to be worn when working with prickly plants such as *Lantana camara*, *Solanum sisymbriifolium*, American Bramble, Scotch thistle as well as with plants that have allergenic properties such as Bugweed hairs and sap of Cestrum and Mothcatcher.
3. Do not wear leather gloves when working on plants that have burs, as burs stick onto these gloves.
4. Rubber gloves and mask to be worn when using herbicides. Protective glasses optional – we do not use herbicide spray, only the paint-on one.
5. People working on the AIPs need to be warned that many plants are toxic, so that, after working on these plants, hands need to be washed before eating, also no rubbing of eyes or nose with contaminated hands.
6. As many species all like to grow in the same disturbed area, it is more efficient to work on all of them in an area rather than just focusing on one species.

7. Sites with AIPs often seem to collect litter – litter should be removed from those sites, so plastic bags for litter collection and a litter picker is advisable to take to the weeding site.
8. A small First Aid kit (rubber gloves, cotton wool, gauze, clean water, antiseptic, and plaster of various sizes) is useful for possible minor cuts or abrasions whilst working on AIPs.
9. Disposal of AIPs
 - i. AIPs that have been pulled out roots and all, and branches that have been cut, can be left on site to decompose, with the exception of the Opuntias and Cereus.
 - ii. Where manageable, fruit and seeds must be put in plastic bags (“bagged”), the full bag knotted closed, and taken to a garbage disposal site, where they will rot. The fruit and its seeds must not be left on site, as they will sprout and grow again. DO NOT attempt to burn dry seeds! Hot air rises and will take dry seeds with them, the breeze will disperse them, and a new hot spot of that plant will be created e.g. Pompom weed seeds.

Tools



Litter picker, secateurs, weeding fork, foldable saw and tree popper



Tree popper used to “pop out” Lantana rootstock



- **Tree popper** to pull out, roots and all, young AIP trees and shrubs. Three sizes are available, the bigger size to be used on bigger plants. Tree poppers do not work on herbs as those have a fleshy stem, which breaks easily when trying to “pop” them out.
- **Strong small weeding tool** – to dig out herbs and young shrubs. A long, strong screwdriver can also be useful.
- **Secateurs** to cut away branches that are in the way.

- **Saw** to cut down the tree, if herbicide is to be applied – we use the paint-on herbicide, not the spray, as spray can easily reach other indigenous plants as well as the person doing the spraying.



- **Leather, elbow high welding gloves** – for working on thorny plants such as Lantana and Pyracantha, and on poisonous plants such as Bugweed.
- **Panga/ Machete** to strip tree bark all the way around the stem (ring barking), from knee height, down to the roots – this should kill the tree, but still follow-up is required for possible coppicing.
- A basket is useful for carrying the herbicide, a small container with water for the brush, small weeding tools, **plastic bags for fruit and seeds**, (bag above right, is full of Jerusalem cherries' fruit - small First Aid kit, notebook & pen and a small towel for wiping hands on
- **Herbicide and brush** – herbicide is only used if mechanical means and biocontrol do not work.

- Information on **herbicides for AIPs** can be found in “Problem Plants and Invasive Weeds in Southern Africa” by Clive Bromilow, 2018 edition (1). FroK uses Kaput gel, which is a water-based paint-on herbicide. The herbicide application and safety instructions must be followed. It is important to apply the herbicide within ten minutes of cutting the tree as it loses effectiveness if applied later.



Kaput gel herbicide used successfully on *Cotoneaster pannosus*

- **Big garden fork, pick and/ or pinchbar (gwala)** – to assist in taking out AIPs with a big root system such as Lantana, Pampas grass, *Phytolacca octandra*, *Cyathula uncinulata* (Burweed).
- **Android (Smart) cell phone** for recording purposes.

Need for recording work done on removing AIPs.

Work done must be measured to prove that work has been done.

Management plan – in order to know what plants are alien or other invasive problematic plants in the area of management, one needs to be able to **identify** the plants, hence this book.

Quantity or number of plants in that area – counting each plant of a species that needs to be removed - if numbers are too big to count individually, one has to estimate how many there are.

Location – where exactly these plants are growing – GPS recordings are far more accurate than just a description, but descriptions are useful additions. Recording methodology will be discussed in the next pages.

Same to be done on **each invasive, problematic plant** in the located area.

What **tools** are needed to remove the plants.

How to dispose of them – stop the spread of seeds or root suckers.

Workers to have a ‘hands-on’ manager who ensures that the work is done properly. The manager needs to be familiar with the invasive plants to be removed, the methodology, the recording procedure and how to pass on work done by the workers onto their contractor and other management.

Follow-up – 3 monthly, 6 monthly or yearly, and recording of the hopeful improvement of the infested area. Comparison, this is part of the original management plan.

Ongoing recording of location and numbers of plants removed, as well as observations of the occurrence of other, new problem invasive plants in the area of work.

Forward planning – what should replace the plants taken out?

Documenting AIPs removed in Kloofendal

The bulk of this book deals with qualitative descriptions of the AIPs, the **why**, **what** and **how** of control of AIPs.

The Friends of Kloofendal are developing methodologies to quantify the process of controlling AIPs, in terms of **Where**, **How much** and **When**.

Where - what place or position.

How much – How many and how big

When - at what date and time

We are using an Android Cellphone App called GPS Essentials to record groups of AIPs removed from the Kloofendal NR as Waypoints.

Once the App is set up and a Waypoint is requested, we follow a few simple steps to check that the location accuracy is sufficient, namely

- Checking that the location is accurately estimated, for example with the error (δ) is less than 10m.
- Entering the common name of the plant(s)
- The number of plants
- Any relevant comment

Add Elements

WAYPOINT	CARDS	CATEGORY	TRACK
Good location accuracy	27 satellites visible, 14 used from gps, $\delta=3.79m$		
Unused Icons			
Species name	Bugweed		
Number Removed and any comments	3 big		

CREATE
Keyboard

Documenting AIPs (Continued)

AIP removal has been recorded by more than eight people to date using the GPS Essential app. The recordings are exported by email or WhatsApp to Dr Steve Spottiswoode as KML format file. He reads these files and adds new records to a master CSV file using custom-written software. Further processing is under development to expand analysis and reporting of the data. This includes clustering and filtering of locations in space and time.

We are experimenting with quantifying places where AIPS still need to be removed by entering a negative number in the place of the number removed.

A free on-line programme on <https://www.earthpoint.us/> can be used to generate a file for plotting records in Google Earth. This programme allows for a wider range of icons exported by GPS Essentials as well as colours and symbol sizes

#	Species name	Number	Date	UT Time	Longitude	Latitude
2157	Mexican Poppy	26	2023/10/28	06:58:40	27.9096	-26.1626
2158	Seringa	1	2023/11/01	06:05:46	27.8802	-26.1294
2159	Blackwood	2	2023/10/13	06:25:40	27.8786	-26.1302
2160	JC	41	2023/10/13	06:25:50	27.8786	-26.1302
2161	FMN	240	2023/11/13	09:31:17	27.8811	-26.1283
2162	Gooseberry	94	2023/11/13	09:31:29	27.8811	-26.1283
2163	JC	60	2023/11/13	09:32:14	27.8810	-26.1283
2164	Prickly Solanum	5	2023/11/13	09:33:46	27.8807	-26.1282
2165	FMN	392	2023/11/13	09:36:49	27.8808	-26.1282
2166	Gooseberry	25B	2023/11/13	09:37:18	27.8808	-26.1282
2167	JC	41	2023/11/13	09:37:31	27.8808	-26.1282
2168	Bugweed	2	2023/11/13	09:37:55	27.8807	-26.1282



Sample of CSV data and a spatial plot of recordings.

How the individual plant species are described

Each page contains: - please see example on next page.

- a) Latin genus and species name.
- b) Common name of each plant, mostly English name, at times also Afrikaans.
- c) Number allocated to the plant if it is listed on the South Africa's National Invasive Species list 2020 edition.
- d) Category if declared.
- e) Country of origin.
- f) Colour Photograph of each plant, including, where possible, distinguishing features such as flowers, fruit, leaves and if applicable, a description of smell and touch.
- g) How to distinguish the plant from similar-looking indigenous, non-invasive plants.
- h) Where generally found.
- i) Removal methodology (Treatment). My preferred methodology is mechanical or biocontrol, avoiding the use of herbicides.
- j) If parts of the plant or whole plant is poisonous, it is described in a red font.
- k) References are marked numerically according to References pages at the back of the book

The plants are divided into 8 colour-coded categories (2) :

Grasses, Trees, Shrubs, Herbs (not woody), Flat-growing herbs, Creepers, Succulents, Water weeds.

Within each category, the plants are arranged in alphabetical order according to the Latin genus and species name.

Each plant is allocated one or two pages.

(c) 338

(a) **Solanum mauritianum**

(d) 1b

Family: Solanaceae

Common names: (b) Bugweed, Luisboom

Tree

Origin: (e) South America



HOW INDIVIDUAL PLANT SPECIES ARE DESCRIBED

(f)



A shrub or small tree up to 4m high covered with whitish-feltly hairs.

(f)



(g)

Big leaves with fine hairs, distinctive strong, unpleasant smell upon touching leaves and branches.



(f)



(k) (9)

Purple flowers in compact, terminal clusters on densely feltly stalks up to 10cm long all year round.

Spherical berries which start off green and turn yellow, growing in compact terminal clusters.

(h) Where found?

In disturbed ground.

(j) Hairy leaves and stems are a respiratory tract and skin irritant. Hairy fruits are

(g) **Not to be confused with** *Vangueria infausta* (Wild Medlar) young plants look similar, but *Vangueria* leaves don't have the strong, unpleasant smell of the Bugweed.



(i) Treatment

Pull out with tree popper if plant is young.

Bag fruit & seed. Cut down to ground level, then paint on herbicide or, if single stemmed, debark with axe or garden fork. The bark peels off easily.

45

Arundo donax

1b

Family: Poaceae

Common names: Giant or Spanish reed

Grass

Origin: Asia

A tall and vigorous aquatic reed growing 2-6m high spreading from tough, fibrous, horizontal underground rhizomes, which can grow roots when the stems are cut, used for stakes.



(9)

Pale green to bluish green leaves, long and slender in profile, leaf tips are not rigid and penetrating like *A. mauritianus* (3)



(3)

Inflorescence: Compact, spear-shaped, flowering late summer, but rarely flowering on the Highveld.(3)

Where found?

In and near watercourses all around Johannesburg but not in the Kloofendal Nature reserve.



Broad lobes at leaf base.

Not to be confused with

Phragmites australis which grows up to 4 meters high, so is much shorter than *A. donax*.

P. australis and *A. donax* both grow in or near sources of water but *A. donax* often occurs on sites away from water (3)

P. australis has not got broad lobes at leaf base

P. australis' inflorescence is more open and feathery.

Treatment

C. Bromilow suggests cutting the reeds to ground level, stack the branches and preferably burn them. Caution not to use as stakes for the garden as pieces can regrow. Allow reeds to grow 1-2 meters, which usually takes 6-8 weeks, before applying a recommended systemic herbicide. Thorough follow-up is essential for effective control. Observe any restrictions on the herbicide label before subsequent water use. (1)

Family: Poaceae

Common names: Jubata grass, Pampasgras

Grass

Origin: South America

Vigorous, tussock grass up to 3m in diameter, with flowering stalks up to 3m high. This grass invades open grassland, roadsides, riverbanks and wasteland. It was introduced into South Africa to stabilize the mine dumps and as an ornamental plant. (9)



(9)

Leaves are bright green, with long slender blades, which are either flat or V-shaped. Margins of the leaves are sharp. Some people have allergic reaction (bad rash) to the leaves when trying to take out the grass. The flowers can cause irritation to eyes and nose and respiratory tract.

Where found?

It grows in the goldmine and power station on eastern side of reserve and on the top Eastern part of Rocky Ridge (Yellow) Trail next to path.



Leaf blades are flat. Flowers are yellowish or purple, loosely branching inflorescence, flowers from November to February. It spread through its seeds. (9)

Treatment

Cut off the flowers before seeding, bag them, leave to rot in a closed- up garbage bag. Dig out stumps, which is a huge job because of its rhizomatous roots. We find a pinch bar (gwala) useful in digging the plant out. First cutting off the leaves with a panga makes digging out the stumps easier.

ND	Paspalum notatum	
Family: Poaceae Common names: Bahia grass		Grass
Origin: Asia		
A dense, mat-forming perennial grass spread by strong rhizomes and seeds. It grows in any type of soil.		
		<p>Inflorescence is a pair of racemes ("fingers")= paired digitate. pointing upwards. Spikelets are rounded, hairless, shiny with dark purple flowering parts sticking out. Flowers from December to April (6)</p> <p>Not to be confused with <i>Paspalum scrobiculatum</i>, Spaced-digitate, not paired digitate. A tufted grass, not a creeping grass.</p>  <p><i>Urochloa mosambicensis</i> racemes are semi-digitate. A hairy tufted grass with stolons. It likes light shade.</p> 
Where found? Amphitheatre lawn, disturbed areas in the reserve such as next to paths. In road reserves, lawns and gardens in towns and cities (6)		<p>Treatment This weed should be controlled by physical removal before becoming established (1).</p>

Family: Poaceae

Common names: Kikuyu grass

Grass

Origin: Tropical East, Northeast and Central Africa

Category 1b in protected areas and riparian areas. Otherwise not listed.



Dense, mat forming perennial grass, which spreads quickly from stolons (creeping stems above the ground), growing roots from their nodes - see picture above and below, rhizomes (underground creeping stems) and from seed spread by animals and waterflow.

Where found?

Amphitheatre lawn, disturbed areas in the reserve such as Southern, upper part of reserve at sewerage leak site and place where building structures have been.



Flowers – very small, hidden partly by leaf sheaths, only white feathery stigmas or anthers are visible (3)

Not to be confused with

Cynodon dactylon/ Couch grass, an indigenous grass, also with many stolons and rhizomes, but leaves are narrower and shorter, and inflorescence is true digitate (four or five terminal racemes/ “fingers”)

Treatment

Dig out, particularly near buildings, areas with tiling or bricks as Kikuyu grass manages to push its way under tiles, lifting them, and in between bricks. It seems to be a host to many small ants.

Family: Poaceae

Common names: Fountain grass

Grass

Origin: North Africa



A tussock-forming perennial grass with feathery, spike-like inflorescences. The bristles are long and detach with the spikelets.

Spreads by rhizomes and seed.

The inflorescence is about 10-25 cm long and rose or purple-coloured. (1)

Where found?

Roadsides and waste places.
Introduced as ornamental grass from North Africa.

Strong pioneer forming stands along road verges and in other disturbed sites with the potential to spread into adjacent natural veld, replacing the indigenous vegetation. (9)

This grass is used for sand binding and as an ornamental in flower arrangements but is obstructive along roadsides.

(3) & (1)

Treatment

Bromilow (1) recommends industrial herbicide. In Kloofendal Fountain grass is not an invasive problem, so not treated as such.

Family: Fabaceae

Common names: Bailey's wattle

Tree

Origin: South-east Australia

A small evergreen tree, growing 3-6m in height with branchlets covered in greyish or silvery-blue foliage.



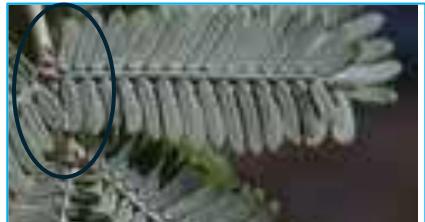
Leaves are bipinnately compound (twice divided), 2-5cm long. (9)

Leaves are arranged spirally around the branchlets.(9)



Where found?

Along rocky path in reserve.



(3)

A gland occurs at the junction of each primary leaflet pair or only the top few primary leaflet pairs.



(9)



(3)

Flowers from July to September with bright yellow globular flower heads in showy sprays. (9)

Treatment

As for *A. dealbata*, but in Kloofendal we have not worked on *A. baileyana* yet, there are not many.

Family: Fabaceae

Common names: Silver wattle

Tree

Origin: Australia

A fast-growing evergreen tree or shrub, reaching heights of 5-10m.

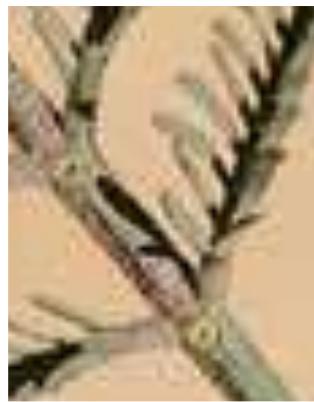
Unarmed (no thorns).



Leaves are silver-grey to light green, bipinnately compound, very bluish in colour, with finely haired short leaflets.

Where found?

In Kloofendal growing in clusters.



(3)

Branchlets are shallowly ridged often tinged with grey or purple. *A. dealbata* has a raised gland at each junction of pinnae pairs.



(9)

Pale to bright yellow, globular flowerheads, flowering July, August.

Family: Fabaceae

Common names: Silver wattle

Tree



Fruit/seeds: Brown or purplish brown flattened pods.

Not to be confused with



Acacia mearnsii (Alien invader), also, bipinnately compound leaves, but leaflets are dark, olive green, not silver-grey to light green. Leaflets, like *A. dealbata*, are short and crowded.



A. caffra – indigenous tree.
Young plants have hooked thorns.



(7)

Elephantorrhiza elephantina, an indigenous shrublet from a large, red, woody underground rootstock, often forming extensive stands. Leaves are bipinnately compound, dying back in winter. Pale, yellow flowers in dense elongated spikes arising from the main stem near ground level.

Treatment

Tree-pop the young Wattles. Bigger ones, cut down low, remove bark all the way down to roots, remove new sprouts every six weeks, until no more sprouting.

Family: Fabaceae

Common names: Pepper wattle tree

Tree

Origin: Australia



(9)

A large, oval shaped evergreen, unarmed (no thorns) tree up to 20m high.



(9)

Bipinnately compound leaf (twice divided). Leaflets lance shaped.



(9)

Fruit – straight, flat brown pods, 4-17cm long.

Where found?

On rocky hillside.



(9)

Pale yellow or cream globe-shaped flowers, the flower heads in large sprays in terminal panicles, appearing in October to December.

Treatment

Dig out small plants, tree pop young trees, big trees, with saw cut around stem into bark knee height, with weeding fork, loosen the bark at the cut, and strip off the bark downwards, it comes off quite easily, secateurs can help to cut away small branches.



9

Acacia longifolia

1b

Family: Fabaceae

Common names: Long-leaved wattle

Tree

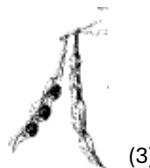
Origin: Australia and Tasmania, the long-leaved wattle was cultivated in South Africa for dune reclamation.

The Long-leaved wattle is an evergreen shrub or spreading tree 2-6m high. Like most species of Australian Acacias, it has phyllodes (enlarged, flattened, green stalks) rather than true leaves, which are mostly straight, but occasionally curved. (Wiki)



(10)

Phyllodes are bright green, up to 180mm long, with 2-5 prominent longitudinal veins. Inflorescences occur singly or in pairs in the phyllode axils on stalks with a length of less than 2 mm. The cylindrical flower-spikes have length of 2 to 4.5cm packed with bright pale yellow-coloured flowers, which flower between June and October. (Wiki)



(3)



(9)

Seed pods

Galls

The fruits are pods that are beaked apically, and constricted between the seeds (3). Stems usually have smooth, spherical outgrowths or galls (caused by an introduced wasp); the galls are green turning brown, replacing flower and leaf buds (3)

Not to be confused with*Acacia saligna* (Port Jackson Willow)

Replaces indigenous vegetation in Eastern & Western Cape, luckily not in Gauteng.



(9)

Where found: Quarzitic rocky north-facing slope in the centre of reserve.

TreatmentAs for *A. dealbata*

10

Acacia mearnsii

2

Family: Fabaceae

Common names: Black wattle

Tree

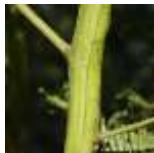
Origin: Eastern and South-Eastern Australia.



An evergreen tree growing 5–10m high, unarmed, bipinnately compound leaves (twice divided), leaves dark olive green, finely hairy, growth tips golden and hairy.



Suckering from the roots = new plants growing along the roots.



Bark: Young trees, bark green
Old trees, rough, greyish bark.

Where found?

All over Kloofendal, growing in the midst of copses.



(3)

Extra floral nectary (raised glands) at, & between junctions of pinnae pairs.



(3)

Pale yellow or cream globular flower heads, flowers August, September – later than *A. dealbata*



(9)

Finely haired, dark

Family: Fabaceae

Common names: Black wattle

Tree**Not to be confused with**

Acacia/Senegalia caffra which is indigenous. Young plants have hooked thorns.



Elephantorrhiza elephantina (7)



Chamaecrista comosa (7)

Perennial herb with woody rootstock.

Compound, stalked leaf.
Flowers with yellow petals, sepals brownish, often tinged with red. (8)

Treatment

As for *A. dealbata*

Family: Fabaceae

Common names: Australian blackwood

Tree

Origin: Eastern and South-eastern Australia.



Adult tree, grow tall and large.
Young Blackwood tree, very green, firm “leaves”, pointing upwards.

Often on young plants, the phyllodes (leaf stalk) bear a bipinnately compound leaf that falls off later.



(9)

Not to be confused with



Leaf-like petioles

- leaf-like petioles (stalks) with no leaf blade, greyish turning dark green, erect straight to slightly curved with 3-7 prominent longitudinal veins.



(7)

Searsia (Rhus) lancea which has a trifoliate leaf, with each leaflet having a single longitudinal vein.
Acacia longifolia. Also has phyllodes, but flowers are spikes, not pompoms.

Where found?

All over Kloofendal, older ones usually are surrounded by young ones, due to suckering, growing in the midst of copses of indigenous plants.

Treatment

No sawing down of *A. melanoxylon*, without trying to ringbark or application of herbicide. If just cutting down, intense coppicing will result.

Family: Fabaceae

Common names: Pearl acacia

Tree

Origin: East and south-east Australia



Phyllodes - leaf-like petiole (leaf stalk) with no leaf blade, silvery grey to dull green, with a single midrib and a tip sticking out at the top of the phyllode.



On young plants and coppices, the phyllodes (leaf stalks) bear a bipinnately compound (twice divided), leaf. These fall off later.

Where found?

On rocky hillside.



Flowers in May – August

Bright yellow, globular flowers in long showy sprays (3)

Not to be confused with

Eucalyptus cinerea (Florist's gum (Penny gum))



Leaves are silvery, coin shaped and have the typical Eucalyptus smell.

Treatment

Tree pop young trees. Bigger ones, cut low and paint stump with herbicide.

13

Ailanthus altissima

1b

Family: Simaroubaceae

Common names: Tree of heaven

Tree

Origin: China



(11)

A deciduous tree which can grow into big dense stands, it suckers profusely.

This invasive, odiferous tree is **toxic to other plants**.

Allelopathic components chemically restrict growth of neighboring plants.

A thick mat of lateral roots that particularly prevent native plants from gaining ground.

Where found?

Next to dam – we have pulled them out.

Leaves of the Tree-of-heaven are pinnately compound (once divided), meaning they have a central stem (red in colour) onto which leaflets are attached on each side. The leaflets are lance-shaped with smooth or "entire" margins.



At the base of each leaflet are one to two protruding bumps called glandular teeth.

13

Ailanthus altissima (cont.)

1b

Family: Simaroubaceae

Common names: Tree of heaven

Tree

Flowers (12)



Flowers –close-up (12)



Winged seeds (12)

A secretion from the shoots can cause allergic skin reaction in some people (1)

Not to be confused with

(13)

Trema orientalis – indigenous tree which occurs in the Magaliesberg, not in Kloofendal. Simple leaves, alternately arranged, leaf margins are finely serrated, fruit are drupes, turning black when mature.

Treatment

Young plants to be removed with tree poppers – works well. Big plants should be cut down and herbicide applied, or ringbarked. Follow up to ensure that root suckers are not formed.

Family: Myrtaceae

Common names: Weeping bottlebrush

Tree

Origin: New South Wales and Queensland in Australia



(9)

A shrub or small tree , often occurring along watercourses. It grows up to 8 meters in height and has drooping branches with leaves which are 3 to 7 cm long and 3 to 7 mm in width.



Where found?

On embankment of the Kloofendal dam.



flower

The bright red flower spikes, which are 4 to 10 cm in length and about 3 to 6 cm in diameter, occur between spring and summer (3).



Treatment

Unwanted plants should be cut down and removed (1). Tree popping if plants are small enough.

Family: Cannabaceae

Common names: Nettle tree, Mediterranean hackberry

Tree

Origin: Southern Europe, North Africa and Asia minor (Wiki)

Celtis australis is a deciduous medium tree with a round, spreading shape 15-20 m, simple rough leaves.



Leaf of *Celtis australis* has coarse hairs and a tapering tip.



The bark is thin, grey or pale brown, and smooth, with horizontal wrinkles; sometimes becoming more rugged with warty excrescences in old age.

Where found?

Kloofendal wetland – hybridised with *C. africana* & *C. sinensis*

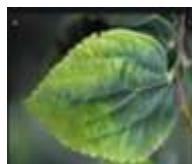
Flowers yellowish, small, axillary, flowering in spring.



(3)

Fruit – drupes, yellowish white becoming purple or black, globose berries in summer, on short, strong stalks.

Not to be confused with



Celtis africana has a more rounded leaves, not a tapering tip, is covered with soft hairs, margin toothed over upper half or two-thirds. *C. africana* is indigenous.

Treatment

Tree pop young trees.

Trees too big for tree popping, cut stumps to less than 10cm above the ground and immediately after cutting, paint with a recommended herbicide.

Family: Cannabaceae

Common names: Common hackberry

Tree

Origin: Canada, USA

Deciduous tree to 20 m high with a grey, furrowed trunk, becoming warty with age and spreading crown.

Leaves: Bright green, slightly glossy and usually smooth above; paler and hairless, or hairy only on veins, beneath. (3)



(3)

Fruit, globose, yellow or orange, turning purple or black, tipped with a thick beak. (3)

Not to be confused with

Celtis africana, *Celtis sinensis* & *C. australis*, all have smooth trunks whereas *C. occidentalis* has a furrowed and later on, a warty bark.(3)

ND

Celtis sinensis & hybrids

Family: Cannabaceae

Common names: Nettle tree, European hackberry

Tree**Origin:** China, Korea, Japan

(3)

Leaf of *Celtis sinensis* – smooth and shiny, quite long compared to *C. Africana*.



(14)

Fruit are drupes, green turning dark orange, globose (3).

Not to be confused with

(3)

Celtis australis which has dark green, glossy, rough and hairless above and softly hairy and greyish green below.



Celtis africana, has more rounded leaves, not a tapering tip and is covered with soft hairs, margin toothed over upper half or two-thirds. *C. africana* is indigenous.

All *Celtis* species are **poisonous** (3).

C. australis, C. sinensis, C. occidentalis & Celtis africana hybrids



Celtis hybrid in Kloofendal

Treatment

As for *C. australis*.

ND

Cinnamomum camphora

Family: Lauraceae

Common names: Camphor tree

Tree**Origin:** East Asia

Evergreen tree 10-26m high, canopy dense, rounded to spreading; bark smooth, green becoming rough, scaly and brownish-grey; trunk becomes massive and spreading at the base.



(9)

Leaves bright green, shiny above and blue-grey beneath, reddish or coppery coloured when young, camphor scented when crushed. Leaves are distinctly three-veined.

**Where found?**

In wetland



Flowers yellowish or green-white, very small, in dainty panicles, appear from September to November.



Fruits are green berries turning black at maturity.

Treatment

Hand-pull seedlings. Tree pop young trees. Ringbark and strip bark down to the roots for big trees or cut down and paint herbicide on the stump (1).

133

Eucalyptus camaldulensis

1b

Family: Myrtaceae

Common names: Red river gum, rooibloekom

Tree**Origin:** Australia

(9)

A tall evergreen tree 18-40m high with a spreading crown and smooth, mottled, white or grey bark



Pale, dull green adult leaves, 12-22 cm long, narrow & pendulous (3)
Juvenile leaves shorter and broader (3)

Where found

West side of reserve



(9)

Twigs and petioles red (3)



(15)

(84)

Buds conical, bud lid 4-6mm long. Flowers cream coloured with long stamens sticking out. Flowers September to January (all year). (3)



(3)

Fruit – brown to reddish-brown capsules.

TreatmentAs for *E. grandis*

ND

Eucalyptus cinerea

Family: Myrtaceae

Common names: Florist's Gum, Penny gum

Tree

Origin: Australia



Juvenile leaves opposite each other for many pairs, stem-clasping, stalkless, round in shape.



(16)



Intermediate and Adult leaves

Intermediate leaves still opposite, but stalked, leaves become more elliptic shaped and bigger.

Adult leaves oval but longer, have stalks and the leaves are alternating up the stem. Crown of mature trees is composed of all three.(15)

Where found?

On west and east side of the reserve.



(17)

White flowers with no petals



(83)



(83)

Flower Buds in groups of three (left) and conical to bell shaped fruits (right).

Not to be confused with

Acacia podalyriifolia, a declared alien invader, which does not smell of Eucalyptus and has sharp tip at end of leaf.

**Treatment**

Tree pop the young trees.
Older ones to be cut low and treated with herbicide (1).

Family: Myrtaceae

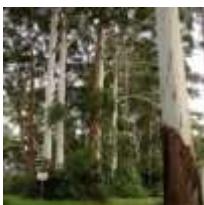
Common names: Bluegum; Rose gum; Saligna
(English); Salignabloekom (Afrikaans)

Tree

Origin: East Australia



(9)



(9)

A tall evergreen tree upto 55m high with smooth bark smooth except for the part of the trunk up to 4m from the ground. The bark peels in long, thin strips to expose a powdery, white, grey-white or blue-grey surface .(9)

Dark green, glossy above, paler below; adult leaves 13–20 cm long,
similar to juvenile leaves.

Leaves have oil glands and have a distinctive Eucalyptus smell.

Leaves have oil glands and have a distinctive Eucalyptus smell.
Cultivated for shelter, timber and honey.

Where found

Mostly on western boundary of reserve. On eastern boundary big trees have successfully been ringbarked and young regrowths have been pulled out.



(18)

Buds 8mm long, pear-shaped with conical lids.(3)



(19)



(85)

Flowers are cream coloured with long-exerted stamens, in simple umbels. (9)

The fruit is a woody capsule commonly referred to as a "gumnut". It has a bluish grey bloom, is pear-shaped, 7–10 mm long, valves protrude and arch inwards.

Treatment

Seedlings can be removed by hand (tree popper) and are susceptible to fire (1). Cutting down trees is no option as they will quickly regrow. A suitable herbicide is recommended, but in the past the huge Eucalyptus trees in Kloofendal were ringbarked successfully.

Family: Fabaceae

Common names: Honey locust, Soetpeulboom

Tree

Origin: Eastern North America

Deciduous, spreading tree 15-20m tall.



(9)

The trunk and branches have three-branched spines.



(9)

Bright green bi-pinnate leaves consist of small paired lance-shaped and minutely toothed leaflets.

Where found?

Not in Kloofendal.

Parks, such as Len Rutter Park, and parking lots such as Northern Farms in Johannesburg.



(20)

Yellowish-green, small flowers in long, narrow sprays 3-6 cm long, Oct–Nov. (3).



(9)



(21)

Dark, reddish-brown flat pods which are often twisted in profile.(9)

Not to be confused with

Black locust/ *Robinia*

pseudoacacia, which has two thorns, not three thorns coming off at the base of opposite leaves and elsewhere on the stem.

Treatment

Not easily controlled physically but cut-stump herbicide or ringbarking knee-high down to the roots can be used (1) .

Family: Bignoniaceae

Common names: Jacaranda

Tree

Origin: NW Argentina

Deciduous or semi-deciduous tree to 22 m high; crown rounded, spreading.



(3)



(3)

Bipinnately compound (twice divided) leaf , dark green, turning yellow in late autumn, hairy, 20–40 cm long.

Where found?

In Kloofendal on rocky ridges.



(3)

Flowers are mauvish blue, lilac or rarely white, tubular, ± 3–5 cm long, in loose, pyramidal sprays at the ends of usually leafless branchlets.



(3)

Fruits are broadly oval, flattish, woody capsules, ± 6 cm long, green turning brown, splitting open after about a year to release numerous flat, winged seeds.

Not to be confused with

Acacia caffra leaves, which, when young, have hooked thorns on the stems.

Treatment

Tree pop out young trees.

Large trees ringbark or cut down below ground level (1)

ND

Leucaena leucocephala

Family: Fabaceae

Common names: Leucaena, Reuse wortel

Tree

Origin: Mexico, even considered a weed there (1).

A perennial shrub, introduced from Mexico as a fodder crop, a source of firewood and as a sand-binder (3).

Unarmed (no thorns), evergreen shrub or tree to 4 (–10) m high; branchlets densely grey-hairy.



(3)

Leaves are bipinnately compound, dark green, often grey-hairy, 7–15 cm long, drooping.

Fruits are brown pods, 11–18 cm long, ~ straight, flattened but raised over seeds, in distinctive clusters, splitting into 2 non-recurving halves.

Where found?

Not seen in Kloofendal but found in disturbed areas in Johannesburg. In Eastern coastal regions in SA. It forms monotonous thickets (1).



(9)

Flowers are white or pale yellow, in globose heads, singly or in groups of 2 or 3 in leaf axils, flowering Jul–March (3)

Whole plant is toxic to livestock when consumed in quantity.

Not to be confused with

(22)

Thorny Acacias such as *Acacia/Vachellia karroo* which also has pompom flowers and bipinnately compound leaves but has (straight) thorns.

Treatment

No experience on Leucaena in Kloofendal but suggest to remove young plants with tree popper.

Older ones, bag fruit, cut down, paint-on herbicide on stump.

Check for regrowth, which must be removed every six weeks until plant is dead.

Family: Oleaceae

Common names: Common privet, Nepal privet, White wax tree, Japanese wax-leaved privet

Tree

Origin: Korea & Japan (9)

An evergreen shrub or small tree 3-6m high.



Leaves are very dark green, glossy, hairless, 3–8 x 2–5 cm wide, ovate to ovate-oblong, usually rounded at the base and shortly tapering to rounded at the apex.(3)



Flowers are white, small, in terminal, pyramidal panicles, 10–20 cm wide and high, heavily scented, Oct–Feb. (3).

Where found?

Near or in water



(9)

(23)

Fruits, initially green, become shiny, black berries up to 1 cm long, fruiting in winter.

Leaves and fruits are poisonous to many animals, but some birds eat them. Pollen is a respiratory tract irritant. (3)

Cultivated for hedging and ornamental in gardens.

Not to be confused with

L. lucidum which is a taller tree (over 10 meters tall) and has leaves with tapering base and apex, and flower panicles are tighter than *L. japonicum*.

Treatment

Young ones take out with tree popper. Older ones, bag fruit, cut down. Since stumps can easily regrow, regrowth to be removed every six weeks until plant is dead. Herbicide application on freshly cut stump if tree is away from water.

Family: Oleaceae

Common names: Chinese wax-leaved privet

Tree

Origin: China, Korea (9)

Evergreen shrub or small tree 3-10m high.



Leaves of young plant
Leaves are opposite, margins entire
Leaves are elongated with tapering bases and apices (3) – compare with *L. japonicum*.
Dark green, thick, leathery, glossy leaves, sometimes variegated in green and yellow.
(9)



Leaves of tree
Fruit and leaves are poisonous to some animals and humans.
(9)

Where found?

Along the stream from Topaz street to Wetland.



(3)

(24)

Heavily, scented white flowers in large terminal clusters appearing from October to February, tighter than *L. japonicum*

Japonicum

Shiny black berries
Some birds prefer the Privet fruit to fruit from indigenous plants, thereby dispersing the seeds. (9)
Privets are used as hedges and ornamentally in gardens (3)

Not to be confused with
Ligustrum japonicum.

Treatment

Young plants take out with tree popper. Older ones, bag fruit, cut down. Since stumps can easily regrow, regrowth to be removed every six weeks until plant is dead. Herbicide application on freshly cut stump if tree is away from water.

Family: Meliaceae

Common names: Seringa

Tree

Origin: Asia, Australia, India

A large spreading tree growing up to 23m high with reddish-brown, smooth bark. It has serrated dark glossy green leaves which turn yellow in autumn.



The leaves are bipinnately compound.



(9)

Young leaflets' margins are deeply serrated (left), older leaflets are finely serrated (right).

Where found?

In Kloofendal mostly in disturbed areas near fencing.



(9)

Clusters of purple to lilac heavily scented flowers appear from September-November.



(3)



(9)

Followed by berries, initially green, turning yellow.

The leaves, bark, flowers and ripe fruits are poisonous.

This tree invades savanna, roadsides, urban open spaces, waste areas and riverbanks. (9)

Treatment

Remove young plants with tree popper. Ones too big, cut low and paint on herbicide, or simply girdle knee high and strip bark off down to the roots.

Family: Moraceae

Common names: Common or White mulberry

Tree**Origin:** Northern China

(9)



(9)

On young, vigorous shoots, the leaves may be up to 30 cm long, leaf margins scalloped and often irregularly lobed (left picture).

On older trees, the leaves are generally 5-15 cm long, unlobed, cordate at the base, rounded to acuminate at the tip, and serrated margins (picture right).

Leaves turn yellow in autumn.

Small greenish flowers forming in cylindrical spikes appearing in spring.

Where found?

Near Kloofendal main entrance, and west side of reserve on red trail



(9)

Mulberry fruit when unripe is green but turns red and later black when ripening.



(9)

Fruit can also be white. Introduced for its fruit and food for silkworms. Fruit of *M. alba* is very tasty, and silkworms mostly eat the leaves of *M. alba*.

Not to be confused with

Celtis africana, *Celtis* hybrids, when young, with *Lantana camara* and Crofton Weed.

Treatment

Tree pop young trees, big trees cut and apply herbicide on stump within ten minutes of cutting.

Family: Pinaceae

Common names: Longifolia pine, Chir pine

Tree

Origin: Himalayas (3)

(9)

General description: Coniferous tree up to 20m high or more; with a conical or oval crown; branches distinctly ascending, secondary shoots absent from trunk; bark very thick and fissured. (9)



(9)

Leaves: Needles, light to bright green, in bundles of three, 15-30 cm long.

Where found?

Invades forest margins & grassland.

The pine tree does not produce any flowers.



Immature female cone (left). Mature female cones (right).



Male cones are much smaller, produced in clusters at the tip of long shoots. The male cones are produced in spring.

In wintertime, *P. roxburghii* produces female cones which are light brown, woody, cylindric-ovoid, large, 15-22 cm long; cone scales elongated and reflexed (see picture above right side)(3)

Treatment

Tree pop the young ones; large plants can be felled or ringbarked.

Family: Salicaceae

Common names: Grey poplar, Matchwood poplar

Tree

Origin: Europa & Asia

(3) Deciduous or semi-evergreen tree 10–20 (–35) m high.

Dense stands formed by suckering from the roots can narrow and block water channels, causing flooding and increased siltation. Extensive stands are likely to cause a significant reduction in stream flow.



Dark green triangular leaves with a broadly serrated profile that are shiny above and white or grey and woolly beneath.

Where found?

Not in Kloofendal, but plentiful in streams in Magaliesberg.



(3)



(3)

Leaves coming off sucker shoots or long shoots are large, up to 12 cm long, triangular, evenly toothed or not toothed and shallowly lobed, wooly beneath (left picture).

Leaves of short shoots are much smaller, 3–6cm long, ovate and bluntly toothed, almost hairless underneath (right picture). (3)



(3)



(3)

The bark is white or grey with horizontal dark lines, becoming rough and darker with age.(left picture). Buds and young twigs thinly downy.

Flowers are reddish catkins (male only), \pm 6 cm long, in spring. (right picture). No fruits.

Treatment

Young trees can be tree popped. Large trees ringbarked or felled, and entire root system removed (1).

Not to use herbicides on plants in water.

Family: Rosaceae

Common names: Black cherry, Wild cherry

Tree

Origin: North America

Black cherry is a deciduous tree, growing up to 15-30 meters tall, with a trunk diameter of up to 70-120cm.



(9)

Very broken, dark grey to black bark .



Finely serrated leaf, red petiole. Leaf arrangement is alternate.

Black cherry is a leading cause of livestock illness

Where found?

In amongst other trees, often sticking out above other trees.



(7)



(3)

The flowers are small (10-15 in diameter), with five white petals and about 20 stamens, and are fragrant. There are around 40 flowers on each raceme.



(7)



(9)

Fruit/seeds are drupes, 1cm in diameter, green to red at first, ripening to black. (9)

Not to be confused with
Prunus africana, leaves of which have a smooth margin.

Treatment

Young plants remove with tree popper.

Big trees ringbark or cut and paint stump with herbicide.

Family: Fabaceae

Common names: Black locust, False Acacia

Tree

Origin: North America

In young *Robinia pseudoacacia* the leaves are simple (left picture below). Spines already very vicious-looking, coming out in pairs.



(25)

(26)

In older *Robinia pseudoacacias* (right picture above) the leaves are pinnately compound, spines coming out at base of leaf stalks and also elsewhere on the stem. Simple and compound leaves are found on the same bush. It suckers freely and often forms thickets. (9)

Where found?

Infestation found on northeastern border of reserve, bordering on neighbouring gardens.



(9)

(27)

Typical white Acacia flowers in drooping sprays from September to November
Reddish-brown pods.



(8)

Seeds, leaves and inner bark are poisonous.(9)

Not to be confused with

Acacias – most African Acacias have thorns, not spines (= stem ending in a sharp point).

Treatment

Tree pop the young trees.
Cutting down tree and applying herbicide partly works, it does encourage more suckering, but repeated cutting away new growth eventually does kill the tree.

ND	<i>Salix babylonica</i>		
Family: Salicaceae Common names: Weeping willow		Tree	
<p>Origin: Northern China</p> <p>One of the most prominent invaders of the Grassland biome of South Africa (3). They are a threat to replace the indigenous species.</p>  <p>(29)</p> <p>Deciduous tree 5–18 m high; branchlets slender, hanging vertically, almost to the ground.</p>   <p>(29) (30)</p> <p>Leaves are bright green above, pale or grey beneath, 16 X 1.5cm with finely serrated margins, ending in a long tapering point. Spring leaves are silky, summer leaves are hairless. They turn a gold-yellow in autumn.</p>	<p>The flowers are greenish, tiny, 1mm long, arranged in catkins, produced early in the spring. Flowers are mostly female and stalkless. Flowering time is August & October. Fruit are greenish, stalkless capsules in catkins, shedding sterile white hairs. It propagates by fragmented branches rooting along the riverbanks. Originally from Northern China but introduced into South Africa from Europe to prevent erosion of riverbanks (1). It provides shade, fodder, honey source and helps to erosion control. (3)</p> <p>Not to be confused with: Indigenous <i>Salix mucronata</i>, whose branches may droop but not vertically, flowers and fruits are stalked, leaves pale whitish-green beneath, without a whip-tip; branchlets often reddish.</p> <p>Where found? Along streams in parks in Johannesburg.</p> <p>Treatment Unwanted plants should be cut down and replaced with indigenous species (1)</p>		

Family: Solanaceae

Common names: Bugweed, Luisboom

Tree

Origin: South America

A shrub or small tree up to 4m high covered with whitish-felty hairs. Big leaves with fine hairs, distinctive strong, unpleasant smell upon touching leaves and branches.



(9)

Purple flowers in compact, terminal clusters on densely felty stalks up to 10cm long all year round.



(9)



(9)

Spherical berries which start off green and turn yellow, growing in compact terminal clusters.

Where found?

In disturbed ground.

Hairy leaves and stems are a respiratory tract and skin irritant. Unripe fruits are poisonous.

Not to be confused with

Vangueria infausta (Wild Medlar) young plants look similar, but *Vangueria* leaves don't have the strong, unpleasant smell of the Bugweed.

**Treatment**

Pull out with tree popper if plant is young.

Bag fruit & seed. Cut down to ground level, then paint on herbicide or, if single stemmed, debark with axe or garden fork. The bark peels off easily.

Family: Fabaceae

Common names: Tipu tree

Tree

Origin: Brazil, Bolivia and Argentina in South America.



(9)

Large, massively branched, wide-spreading deciduous tree up to 23m high.



(9)

Large sprays of golden-yellow flowers in late spring and summer



(9)

Where found?

Widespread, roadside and urban open spaces.



Pinnately compound leaves with bright green, smooth leaflets.

Yellowish-brown, seeded, winged pods 50-60mm long.

Propagation by freely seeding itself – the tree has many seeds.

Treatment

Tree pop or dig out all unintended plants. For adult trees, cut and paint tree stump with herbicide, or ringbark and strip bark down to the roots – not tried out in Kloofendal.

ND

Ulmus parviflora

Family: Ulmaceae

Common names: Chinese elm

Tree**Origin:** China, Korea, and Japan

Leaf margins are bluntly serrated

**Where found?**

Southern part of reserve.

Common garden plant escaped into the reserve, and into other reserves and open areas.

This tree has the potential to be weedy through self-seeding in surrounding landscapes .

It has escaped intended plantings to invade native plant communities. The aggressive root system absorbs water, nutrients and space (Wiki) .

Ulmus parvifolia (Chinese Elm) is listed in the Invasive Plant Atlas of the United States (Gardenia.net).

Not to be confused with

Combretums, they also have winged seeds, but Combretum seeds are 4 winged, not two-winged.

Treatment

It can be effectively controlled using any of several readily available general use herbicides such as triclopyr or imazapyr (Wiki). No work has been done on these plants in Kloofendal yet, as there are only few there.

Family: Solanaceae

Common names: Orange cestrum

Shrub**Origin:** Mexico to Costa Rica

Much-branched, mostly hairless, evergreen shrub 1–2 (–6) m high, producing suckers; stems and leaves bruise easily, emitting an unpleasant smell (3).



Light green, ovate leaves up to 13 x 7 cm.

Orange (rarely yellow), tubular flowers, in axillary and terminal, clusters, flowering Oct–May.

White, spongy berries as fruit, ± 1 cm long. (3)

Where found?

Western side of reserve amongst cut down Eucalyptus trees.

Whole plant poisonous to mammals (3)

Treatment

We have not worked on *C. aurantiacum* as we have only seen a few in K&D but would treat it as for *C. parqui*.

Family: Solanaceae

Common names: Crimson cestrum

Shrub

Origin: Mexico

Much-branched, evergreen shrub up to 4m high; stems and leaves softly hairy and bruise easily, emitting an unpleasant smell. (3)



Light green, ovate-lanceolate, up to 12 cm, evergreen leaves. (9)

Where found?

In streambed at broken bridge on yellow (Rocky Ridge) route along west side of reserve.

Stems and leaves bruise easily, emitting an unpleasant smell.

Whole plant is poisonous.

Crimson, reddish-purple or pink, tubular flowers, 2-2.5 cm long, in axillary and terminal bunches. Flowers October to May.

The fruits are small red, globose, sponge berries.(9)

Treatment

We have not worked on *C. elegans*, no big infestations in K&D, but would treat it as for *C. parqui*.

Family: Solanaceae

Common names: Chilean cestrum

Shrub

Origin: Brazil, Argentina, Paraguay

Evergreen, mostly hairless, shrub 1–3) m high, producing suckers; bruised stems and leaves emit an unpleasant smell. It has a deep and persistent taproot (3). it invades gardens, rural lands and bush land. (9)

All parts of the plant are reported to be highly toxic. It is described as significant hazard to livestock (especially cattle) which may eat green Cestrum inadvertently or during shortages of other foods, often resulting in death (Wiki). Death is usually rapid and painful. (Wiki)



(9)

Yellowish to dark green leaves, alternate, mainly towards ends of branches, narrowly elongated lanceolate, to 15 x 1.5–2.5 cm. Leaves can become broad if shade grown, however leaves are much longer than wide (3).

Where found?

All over the reserve, mostly along fences of neighbouring gardens.



(31)

Greenish-yellow or brownish tubular flowers found in axillary and terminal clusters (31).



(31)

Flowering October to May. (3).



(3)

The fruits are clusters of small, black egg-shaped berries formed during summer to autumn.

Family: Solanaceae

Common names: Chilean cestrum

Shrub**Not to be confused with***Cestrum laevigatum* (Orange Cestrum)

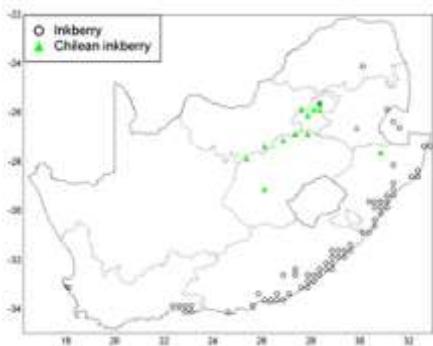
(31)

C. Laevigatum has bigger leaves, and flowers and fruit in axillary clusters towards ends of branches, not in terminal clusters. (31)



(31)

C. laevigatum is found along the South African coast. (31)



(31)

C. parqui is better adapted to the cold highveld where it has been known along the Vaal River for many years although misidentified as inkberry (*C. laevigatum*). Beware of Chilean inkberry (*C. parqui*)! (31)

Family: Solanaceae

Common names: Chilean cestrum

Shrub**Treatment**

We use tree poppers successfully to remove single woody-stemmed young plants. It is important to get plants out before the intense suckering root system develops. Bromilow recommends chemical control, such as triclopyr and imazapyr painting onto stems or cut stumps (1). We were partially successful with painting Kaput 100 Gel on cut, woody, bigger branches of older plants using Kaput which contains the ingredient triclopyr. Cutting and poisoning young growth has not worked at all. The plants' toxic smell made some workers sick. Biocontrol for Cestrum parqui in South Africa has been researched by the Weeds Research Division of the Agricultural Research Council (ARC) in Pretoria and is due to be released as I was informed by ARC students in this field the 2024 Yebo Gogga, Amablobomma exhibition at the University of the Witwatersrand, May 2024.

Family: Rosaceae

Common names: Orange cotoneaster

Shrub

Origin: W. China

Unarmed, gracefully arching semi ever green shrub upto 3 m high. (3)



(3)

The leaves are oval-acute, 2–3.5 cm long and 1–1.5 cm broad, shiny green above, downy below with dense whitish to yellowish hairs. (Wiki). Veins deeply impressed on upper surface. (3)



(32)

Flowers pinkish, about 1 cm across, in clusters of 5-15. (3)



(33)

Fruits are red-orange pomes, usually with 3 seeds.

The fruit is eaten by fruit-eating birds who disperse the seeds in their droppings.

Fruits are poisonous when eaten in quantity.(3)

Where found

In gardens as hedging, ornamental and cultivated for honey. In Kloofendal amongst copses of indigenous plants.

Not to be confused with

C. Pannosus which has smaller and more plentiful berries, smaller leaves

Flower petals are white with spreading petals

Fruits of dull, deep red colour. (9)

C. franchetii, which has:

Bigger leaves, with yellow, gray or white felty undersurface.

Pinkish, not white flowers.

Orange-red, not dull, deep red fruit, with 3 not 2 seeds. (3)

Treatment

Bagging fruit is really not possible, there are simply too many! Seedlings we dig/ pull out, young trees we remove with the tree popper, trees we cut low and paint the stumps with herbicide (Kaput gel) which has been successful.

Family: Rosaceae

Common names: Silverleaf cotoneaster

Shrub**Origin:** S/W China

Shrub upto 3 metres high with arching branches and in autumn with showy, berry-like fruits



Leaves 1-3cm long (smaller than *C. franchetii*), stalks 2-7mm long (*C. franchetii* has very short leaf stalk)

Leaves lower surface densely felty white, flower stalks and calyces too.

Upper surface initially dull greyish green, sparsely hairy, becoming hairless and shiny. Midvein on upper surface deeply impressed, side veins inconspicuous (3)



Flowers are white, 1 cm across, in clusters of 6-12. Flowers from August to January. (3)



Fruits are dull, deep red pomes with 2 seeds. (3)

Fruits are poisonous when eaten in quantity. (3)

Not to be confused with

C. Franchetii – see previous page.

Pyracantha which has sharp spines and in autumn has bright orange berries.

Treatment

As with *C. franchetii*.

Family: Fabaceae

Common names: Bird flower

Shrub

Origin: Tanzania and Kenya

Canary bird bush is an evergreen shrub characterized by flowers that look like a family of canaries perching on a branch, hence the common name “Bird flower”.



(9)

Flowers are lemon-yellow or greenish-yellow, with a projecting greenish or purple beak. Flowering is from spring to autumn.



(9)

Leaves are greyish-green, 3-foliate; leaflets on a short stalk (petiole), petiole mostly longer than leaflets, glabrous to densely hairy.

Where found?

Streambed above dam, and sewerage leak area on top of Rocky Ridge Trail



(3)

Fruits greenish-purple pods, inflated, to 100mm long, seeds loose in dry pod and rattle when the pod is shaken.

Treatment

Remove pods and remove plant with tree popper.

Family: Verbenaceae

Common names: Lantana

Shrub

Origin: Central & South America

A spreading shrub or untidy scrambler growing up to 2m or higher. Stems usually covered with short, stiff hairs and recurved thorns. (9)



Dark green, rough, hairy leaves which are paler below, have serrated margins and smell strongly when crushed. (9)



(9)

Pink, red, crimson, orange, yellow or white flowers in compact, flat-topped heads, often with several colours in one head, appear from September to April. (9).

Glossy green fruits which turn purplish-black.

Poisonous to humans and animals and responsible for livestock mortalities. (9)

Not to be confused with

Lippia javanica and *Lantana rugosa*, both indigenous Verbenas with no thorns on the stems.



Lippia javanica *Lantana rugosa*

(34)

(35)

Treatment

Bag flowers & seeds.
Dig out small plants. For medium size plants use tree popper, which works well. Use secateurs to cut way branches in the way of taking plants out, then use tree popper to pull them out. Big ones cut down and paint herbicide on stump. No slashing as it will just coppice prolifically. Wear elbow length leather gloves for thorn protection.
Biocontrol is available, but only slightly reduces the rate of control. (36)

Family: Oleaceae

Common names: Common privet, Japanese wax-leaved privet

Shrub

Origin: Korea & China

An evergreen shrub or small tree 3-6m high. Dark, almost black-green, thick, leathery, glossy leaves sometimes variegated in green and yellow.



(9)

Leaves ovate to ovate-oblong, 3-8cm long (smaller than *L. lucidum*), usually rounded at the base and shortly tapering to rounded at the apex.



(3)

Sprays of heavily scented white flowers, flowering October to February (summer).

Where found?

Near or in water.



(9)

Fruit, initially green, turning into blue-black berries, fruiting in winter. **Leaves and fruits are poisonous to many animals, but some birds eat the fruit.**

Not to be confused with

L. lucidum, which is a taller tree (over 10 meters tall), has leaves that have elongated base and apex and *L. lucidum*'s leaves are bigger (6-12cm). Flowers are more tightly packed in *L. lucidum*.

Treatment

Young ones take out with tree popper. Older ones, bag fruit, cut down. Since stumps can easily regrow, regrowth to be removed every six weeks until plant is dead. Herbicide application on freshly cut stump if tree is away from water.

Family: Oleaceae

Common names: Chinese wax-leaved privet

Shrub

Origin: China, Korea (9)

Evergreen shrub or small tree 3-10m high. Used hedges and ornamentals.



(9)



(9)



(3)

Leaves dark green, glossy, thick and leathery, large (6–12 cm long), tapered at the base, long-tapering at the apex (3), sometimes variegated in green and yellow (9). Leaves are opposite, margins entire.

Fruit and leaves are poisonous. and the pollen can be an irritant to the respiratory tract in humans .

Where found?

Along the stream from Topaz street to Wetland.



(3)



(3)

Heavily, scented small white flowers appear in large terminal, pyramidal panicles, 15–20 cm wide and high, flowering from October to February.

Shiny black berries.

Indigenous birds could neglect the dispersal of indigenous plants as a consequence of their preference for the fruits of this alien.

Not to be confused with *Ligustrum japonicum* where the leaves are different and **flowers less tightly packed, looser.**

Treatment

As the Privets often occur along the water ways, we do not use herbicide. Tree-pop the young plants, bigger trees, saw down low, strip bark (ringbark) to the base where possible. Cut away regrowth to eventually starve the plants. Follow up.

Family: Oleaceae

Common names: Californian privet

Shrub

Origin: Japan, Korea.

Semi-evergreen or deciduous shrub 3–5 m high. All parts hairless. (3)



(9)



(9)



(9)

Dark green and glossy above, yellowish green below, sometimes variegated with cream or yellow, hairless, ovate-elliptic, 2.5–8 x 1.5–3 cm wide.

Where found?

In stream bed in Kloofendal. It invades water courses, forest and woodland.



(9)

Flowers are white, small, nearly stalkless, corolla tube 2–3 times longer than spreading lobes; in terminal panicles 5–10 cm wide and high, heavily scented (unpleasant or sweet), flowers October to February.

The pollen is a respiratory tract irritant (3)

Fruits are shiny, black berries ± 6 mm long.

Fruits and leaves are poisonous. (3)

Not to be confused with

Ligustrum japonicum or *L. lucidum*, both of which have much larger leaves.

L. ovalifolium is hairless, whereas *L. sinense* has hairy shoots, flower and fruiting panicles.

Treatment

As for *L. japonicum*

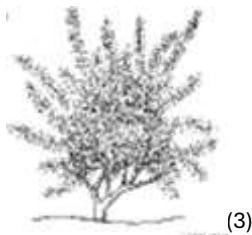
Family: Oleaceae

Common names: Chinese privet

Shrub

Origin: China, Vietnam

Semi-evergreen or deciduous shrub 3–6 m high.



(3)



(9)

The shoots are densely downy. Leaves are mid green, downy on midrib beneath, ovate-elliptic, small compared to other Ligustrums, 2–6cm long x 1–3cm wide. (3).



(3)

Where found?

In stream bed.



(3)

Flowers are white, small, stalked, the corolla tube is as long as the spreading lobes; in terminal, open, narrow, shortly hairy panicles heavily scented, flowers Oct–Jan.

The pollen is a respiratory tract irritant. (3)

The fruits are shiny, black berries up to 1 cm long.

Fruits and leaves are poisonous. (3)

Not to be confused with
Ligustrum japonicum or *L. lucidum*, both of which have much larger leaves.

L. ovalifolium is hairless, whereas *L. sinense* has hairy shoots, flower and fruiting panicles.

ND

***Mahonia oiwakensis* (= *M. lomariifolia*)**

Family: Berberidaceae

Common names: Chinese holly grape, Burmese mahonia

Shrub**Origin:** China, Taiwan

Evergreen Spiky bush, 1 to 7 meters high, growing in the shade in the forest.



The tall long leaves cluster near the stem ends.

Leaves are fiercely spiky (Wiki). Dark green above, yellowish green below, up to 45 cm long, with 12–20 pairs of leaflets and one terminal leaflet; leaflets leathery, ovate-lanceolate to lanceolate, with 2–9 spiny marginal teeth. (3)

Where found?

In Wetland area next to the stream, but neither berries nor flowers have been observed yet, perhaps it is too shady. Also found in Magaliesberg forested areas near water, escapees from neighbouring gardens.



(3)

Fragrant yellow flowers in racemes, blooming in autumn and winter.



Fleshy berries, blue or bluish black, covered with a powdery bloom, conical-ovoid, up to 8 mm long, in spring (3)

Treatment

Remove with tree popper. If not possible, cut and follow up, check for regrowth.

Family: Nandina domestica

Common names: Family: Berberidaceae

Common names: Heavenly bamboo, Sacred bamboo

Shrub

Origin: Japan, China

An erect evergreen shrub up to 2 m tall by 1.5 m wide, with numerous, usually unbranched stems growing from ground level (Wiki).



The glossy leaves are 50–100 cm long, bi- or tri-pinnately compound, with the individual leaflets 4–11 cm long and 1.5–3 cm broad, with entire margins (Wiki).



(37)

The young leaves in spring are brightly coloured pink to red before turning green; old leaves turn red or purple again before falling (Wiki).

Where found?

Kloofendal Wetland



(38)



(82)

Tiny flowers with white petals, pinky-white sepals, flowering in early summer, in clusters above the leaves (Wiki).

The fruit is a bright red berry, 5–10 mm diameter, ripening in late autumn and often persisting through the winter. (Wiki)

The plant is generally considered non-toxic to humans, but the **berries are considered toxic to cats and grazing animals.**

Berries are used in research as an anti-dote for Ecstasy (addictive dangerous drug). (Wiki).

Treatment

Not a problem in Kloofendal so far, so no work done on it, but my recommendation is bagging the fruit and digging it out.

ND

Protasparagus loricinus

Family: Asparagaceae, previously Liliaceae

Common names: Wild asparagus, Katbos

Shrub

Origin: Indigenous (Wiki)

Dense, impenetrable, multi-stemmed bush up to 2 meters high. The leaf function is taken over by dense clusters of cylindrical, unbranched, needle-like stems, called "cladodes". (8)



The leaves are modified curved thorns.



Flowers are axillary, white, sweet scented.

Where found?

Klipriviersberg Nature Reserve and the Magaliesberg, not in Kloofendal.



(40)

The fruits are globose, bright red with 1-3 black seeds. (8)



(42)

The root system is a crown with numerous fleshy tuber-like roots coming off it.

Not to be confused with

Protoasparagus setaceus which is a perennial climber with soft feathery appearance, no spines except on old, main branches. "Leaves" (cladodes) are short – less than 10mm long, and very fine.

Treatment: Wear good leather gloves. With secateurs cut away the prickly branches, cut into smaller pieces and move away from site. With pinch bar (gwala) dig out the big root system, hard work but works well!

Family: Rosaceae

Common names: Yellow fire thorn

Shrub

Origin: South-western China
Evergreen shrub 2-4m high with stiff, spiny branches. Young shoots are covered in thick, yellowish down and woody spines which bear leaves. (9)



(3)



downy calyx

(3)

P. angustifolia leaves are dull dark green above, densely grey-downy beneath, narrowly elongate, margins entire, rolled under, apex rounded, often notched. (3)

Flowers are white with a downy calyx. (3)



Spines are woody, sharp-pointed and bear leaves.

Where found?

Next to path to dam and in the wetland



Orange-red or orange-yellow berries. **Fruits are poisonous.**



Not to be confused with

Pyracantha crenulata



(3)



(3)



(3)

Leaves of *P. crenulata* are bright, glossy green above, duller beneath, hairless, margins shallowly toothed. The apex is acute, bristle-tipped or rounded (rounded in illustration). (3)

Treatment

Wear thick, long leather gloves (our ones are blue, up to the elbow). Dig out small plants, tree pop young trees.
Adult trees: cut and paint herbicide onto stump.

Family: Rosaceae

Common names: American bramble and hybrid brambles

Shrub

Origin: North America

Erect to sprawling, thorny shrub growing up to 2 m high with deeply ridged stems. Spreads through seeds and suckering

It competes with and replaces indigenous woody and grassland species. Dense stands are impenetrable and restrict access to forestry plantations; they also restrict access to grazing and water by domestic and wild animals.



(3)

Leaves are green, sometimes densely grey-downy beneath; usually 3-foliate, sometimes also 5-foliate (lateral leaves re-divided) on new season's growth.(3)



(9)



(3)

Flowers are white, rarely pink, petals much longer than sepals; few, 2–5(–10) at the end of short leafy shoots. Flowers Sep–Jan. (3)

Fruits are red turning black, fleshy, shiny, aggregated berries. Fruits are edible.(3)

Not to be confused with



(45)

The indigenous *Rubus rigidus*, which has whitish colour on lower leaf surfaces and stems and is 3-foliate. (5)

There is much confusion about Rubus species in South Africa, *Rubus cuneifolius* may not occur in Gauteng or the Magaliesberg but its hybrids do.(44). There are six declared Rubus species in South Africa.

Family: Rosaceae

Common names: American bramble and hybrid
brambles

Shrub

Treatment

Cut prickly branches wearing thick leather welding gloves, elbow high, for protection and pull, dig out, where possible removing the underground runners.

Mechanical control alone might help to suppress Rubus species but will not eradicate the plants. Parts of stems and roots have the potential to grow into new plants and therefore a single mechanical operation might actually promote spread. (43)

Several herbicides have been registered for use against Rubus species, mainly as foliar applications to actively growing plants. (43)

There are no biological control agents (insects or pathogens) available for any of the Rubus species in South Africa. (43)

Family: Caprifoliaceae

Common names: Canadian elder, American (or sweet) elder

Shrub

Origin: Eastern and Midwestern United States of America



(9)

The Canada elderberry is a large flowering shrub with multiple stems.

The roots, stems, leaves and bark are very toxic.



Compound leaf with finely serrated leaflets. The upper surface of the leaflet is a darker green and the underside is a paler green with fine white hairs on the veins. (9)

Where found?

In wetland.



The creamy-white flowers are small.



(9)

The fruit is a small berry-like drupe, which begins green, then turns reddish and eventually purplish-black.

Treatment

Tree pop small plants, bigger trees, cut low and damage stump, strip bark to the roots with a panga - we are trying out that method as *Sambucus* is growing in the wetland, so we do not use herbicide there.

Family: Fabaceae

Common names: Arsenic bush, Smooth senna

Shrub

Origin: Mexico and Central America



The arsenic bush is a poisonous shrub that can grow up to 2-3m tall. (9)



The leaves are arranged in pairs opposite each other, consisting of three or four pairs of ovate, shiny leaflets.

Where found?

Not in Kloofendal but in Magaliesberg.



Yellow flowers, which flower from October to March. (9)



The pods are cylindrical, 7-10cm long, containing shiny seeds. (9)

Treatment

Pull out young plants with a tree popper.

ND

Seriphium plumosum/ Stoebe vulgaris

Family: Asteraceae

Common names: Bankrupt bush, Slangbos

Shrub

Origin: An indigenous bush encroacher. It is not an invasive species. (46)



(47)

A sprawling, much-branched, grey shrub. Looking closer, one notices that the slender, wiry branches are softly woody and at right angles to the stem. The short shoots are covered with whitish, woolly, clustered leaves, which are minute, tufted and pressed to the stem, giving the plant a granular appearance (SANBI)

It invades arid and semi-arid grasslands. As it is unpalatable, it reduces the carrying capacity there.

Where found?

Throughout reserve, part of biodiversity, not considered a problematic encroacher plant in the reserve.



Galls, not flowers
(47)

Small brown flowers

Not to be confused with *Athrixia elata*/ Daisy tea



(7)

Treatment

Salt can be sprinkled at the base of each stem; it alters the salinity enough to inhibit growth.

Thick infestations can be burned, regrowth sprayed and slashed. Follow-up treatments and the adoption of proper land management practices are critical factors for long-term control. (1)

Family: Fabaceae

Common names: Red sesbania, Brazilian glory pea, Coffee weed, Rattlepod, Roosesbania

Shrub

Origin: South America

A deciduous shrub or small tree up to 4m high with many slender branches. Drooping, dark green pinnately compound leaves with oblong leaflets that end in tiny, pointed tips. (9)



(9)



(3)

Showy red or orange flowers in dense sprays up to 25cm long flowering from September to March. (9)

Where found?

Wetland stream.



(9)



(9)

Four-winged pods 6-8cm long and 10mm wide, initially green, turning brown with growing mature.

Seeds, leaves and flowers are poisonous. (9)

Treatment

Biological control by means of a beetle from Argentina is proving to be very effective, which is fortunate as chemical methods have failed and slashing it causes vigorous regrowth, so treatment, if no biological control is used, is physically removing the plants, best done after the spring flush when the plants have exhausted their root reserves (1). Problem in Kloofendal is small, so pulling out with tree popper works well.

Family: Bignoniaceae

Common names: Yellow bells, Yellow trumpet bush,
Yellow elder, Geelklokkies

Shrub

Origin: Mexico and Texas,
Arizona and New Mexico in the
United States



(97)

Ornamental densely leafy
evergreen shrub or small tree up
to 4 meters high. Leaves are
bright green above, paler below
with distinctly serrated margins.



(9)

Bright yellow, showy trumpet
shaped flowers in terminal
sprays, flowering from October
to May.

Where found?

In lower parts of the reserve
along neighbouring fence and
along eastern boundary fence.



(97)



(9)

Seedpods, initially green,
turning brown, splitting open to
release papery winged seeds. (9)

Treatment

Remove seed pods and bag
them. Cutting down the multi-
stemmed bush with loppers,
secateurs and saw, trying tree
popping and digging out has not
worked for us.

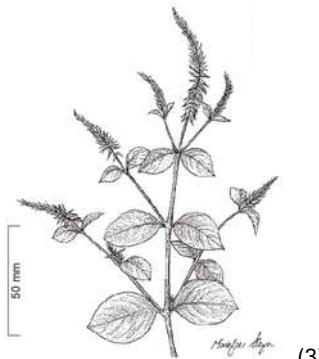
Bromilow, (1) does state that *T.
stans* is very difficult to control
with herbicides. We will
probably experiment painting
herbicide on freshly cut stems,
see if it works.

ND

Achyranthes aspera

Family: Amaranthaceae

Common names: Chaff flower, haak-en-steek-bossie

Herb**Origin:** Pantropical – no clear origin, found everywhere.

Achyranthes aspera is an erect, sometimes sprawling, long-lived herb which can grow up to 2 m tall, with stems becoming woody at the base. Its short-stalked leaves are opposite, simple and egg-shaped; they can be densely to sparsely hairy and are dark green above and paler below, with young leaves often silvery.(49)

Where found?

Next to paths, particularly in the Wetland area, in shady places.



(48)

The small greenish-white flowers, often tinged with purple-red, form terminal spikes, dense at first but elongating up to 60 cm long. As the flowers age, they bend downwards and become pressed closely against the stem. (49)

The fruits are small one-seeded capsules, orange to reddish purple or straw-brown; with their pointed tips, they readily adhere to animals and clothing. (48).

Treatment

Easily controlled by cultivation i.e. just pull/ dig out and leave to dry out, plant will eventually become compost. Preferably pull out before seeding as the seeds are sharp and penetrate the skin if handled carelessly. (1)

Family: Asteraceae

Common names: Crofton weed, Mexican devil, Snake root

Herb

Origin: Central America (Mexico).



Perennial herb or soft shrub up to 2 meters high, stems and petioles purplish red, stems hairy. Stems may be galled. Broken branches have a strong, unpleasant smell.

Grows in or near water, stems creep in lower parts of the plants, rooting at the nodes.

This plant is poisonous, causes chronic pulmonary disease in horses (3).

Where found?

In Kloofendal stream near Topaz street, where stream enters Kloofendal Reserve. Abundant in Wilgespruit stream along Christiaan de Wet Road and in Magaliesberg streams



(9)

Leaves tapering at the base towards an ovate tip, with serrated margins along the distal 2/3rds.

Flowers are white in terminal clusters flowering from August to December. Not to be confused with *Plectranthus*, broken branches of which have a pleasant smell.

Treatment

Try to eradicate before flowering. Uproot plant by grabbing hold of base & pulling. If it does not come out easily, cut off roots close to the plant base & use tool to lever it out. Roots left behind will not grow again, but buried stems will. Discard on dry rock away far enough from the stream so that the plant cannot be swept back into stream.(5)

Family: Papaveraceae

Common names: White flowered Mexican poppy

Herb**Origin:** Mexico

A very spiny annual herb growing up to 90cm high with stems that exude a yellow sap when cut. (9)

Grey prickly leaves, which have a distinctive odour when crushed. (9)

Where found?

Inlet of dam and wetland area.
Partially controlled (2023).



Pale yellow or creamy white flowers appear from September to January. Spiny, oblong green fruit capsules which turn brown and release numerous small black seeds. (9)



(9)

Can cause poisoning, even fatalities in humans and stock.
(1)

Treatment

Bag seeds & flowers, and pull-out the plants, using hand trowel or tree popper, first cutting the thorny leaves away from where one is working. Wear thick, elbow-high leather gloves for protection against the prickles. No slashing.

ND	<i>Bidens Pilosa</i>	
Family: Asteraceae Common names: Blackjacks		Herb
<p>Origin: South America A common, widespread and exceedingly troublesome pioneer. found in most crops and disturbed areas. (1)</p>  <p>Pinnately (once divided) compound leaf with usually 3 , rarely 5 leaflets, with sharply toothed margins. Yellow flower heads with or without white ray flowers. (8)</p>   <p>(50)</p> <p>Blackjack flower Seedhead</p>  <p>Barbed awns (51)</p> <p>Fruits/ seeds are about 1 cm long, with two to three stiff, heavily barbed awns at their distal ends allowing the seed to burrow into clothing and hair – extremely efficient method of dispersal. (52)(1).</p> <p>Where found? Any disturbed areas in Kloofendal.</p>	<p>A prolific seeder, often producing several thousand per plant, it can complete a life cycle (germination to shedding of seeds) in as little as 50 days. Viable seeds may be produced when the plant is a few cm high. Uses from the internet:</p> <ul style="list-style-type: none"> (i)Treatment for stinging nettle and other skin inflammation, rub the plant onto the affected area. (ii) Young leaves are eaten as a spinach by some people (1). To me it tastes bland. <p>Treatment Ruderal weed, pioneer. Indigenous plants will take over in natural succession but in disturbed areas the Blackjack can spread effusively and grow high. We suggest slashing the plants about 15cm high before they seed. This will keep the ground covered with vegetation preventing seeds lying around to germinate. Pulling out plants will promote unwanted new growth in the loosened soil. Pulling out the odd plant amongst indigenous vegetation is good, as that allows the indigenous vegetation to replace the Blackjacks.</p>	

Family: Asteraceae

Common names: Pompom weed

Herb

Origin: Central and South America.

A tall erect perennial herb plant.



Leaves are concentrated at the base of the plant with a single flower stem growing upwards. (9)



Leaves and branches have rough, bristly hairs. Leaves are light green, are lance shaped and have serrated margins.

Where found?

All over Kloofendal amongst grasses in sunny areas in rocky ground.



The crown at the base of the stem has roots and succulent tubers (storage organs) growing from it (46).



(3)

Pink flowerheads surrounded by purple bracts in compact heads flowering December to March. (3)

Family: *Campuloclinium macrocephalum*
Common names: Pompom weed

Herb



Tall stems up to 1.3 meters high.



(9)

Seeds become brown when ripe,
fall off the flower very easily.



(54)

Lack of control will result in
grassland being totally replaced
by Pompoms.

Treatment

Bag seeds & flowers & dig out plants, make sure that the root crown is removed, as the roots without the crown will not grow again.

Bags of Pompom seeds to be knotted closed and left to rot. They decompose well.



Crown and roots must be dug out and hung upside down on other vegetation to dry out and die.

No slashing.

Ongoing follow-up during the flowering season is essential.(5)

Leather gloves are recommended as leaves and stems have coarse hairs.

Biocontrol is available (36)

Family: Cannaceae

Common names: Garden canna, Wild canna, Indian shot, Tuinkanna

Herb

Origin: Central and South America and the West Indies.

Perennial, rhizomatous herb with erect, unbranched, leafy shoots 1–2 m high. The rhizomatous roots are strong and difficult to eradicate.



Leaves large, narrowly ovate to elliptic, tapering to a point. sheathing the stem (3).

Where found?

In flower bed in Kloofendal amphitheatre area. Many are found in Johannesburg parks such as Len Rutter Park, Florida, and other public open spaces.



(9) (9)
Narrow flowers, red or orange, usually yellow below, no fragrance. Flowers September to April, to all year (3).



(9)
Green, spiny fruits

Found on stream banks where it competes with and replaces indigenous species, it is also recorded as a host for a number of crop pests. (1)

Treatment

Dig out & remove rhizomes (1).

Family: Asteraceae

Common names: Scotch thistle, Spear thistle

Herb

Origin: Europe, Asia and North Africa. (9)

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



{3}

Leaves are dark green with stiff hairs above, white woolly beneath, deeply lobed, the lobes ending in strong spines (3).

Stems have spiny wings (9)

It causes heavy infestations that reduce the carrying capacity of the veld and can cause injury to man and animals. (9) The sap is an irritant to skin, causes dermatitis in humans (3)

Where found?

Wetland and area adjacent to neighbours on N/E side of wetland.



(9)

Pink to mauve thistle-like flowers surrounded by spiny bracts appearing from September to April.



Each small fluffy unit (A) is an unopened tiny fruit (Achenes) within a tuft of silky hairs of 2cm long. Fruits will open up once on the ground, releasing its seeds.

Treatment: Remove plants before flowering. Once seeded, it is recommended to bag the seed heads, cut away spiny leaves, then dig the plant out of the ground. One needs to wear thick leather gloves for protection against the spines.

ND	<i>Conyza sumatrensis</i> var. <i>sumatrensis</i>/ <i>Conyza albida</i>	
Family: Asteraceae Common names: Tall fleabane		Herb
Origin: America Annual major weed over 2 meters high. Growing in gardens, along the roadside, fallow land, forests and can infest perennial crops and is known to host the tomato spotted wilt virus, known as "Kromnek" in tomatoes, potatoes, tobacco and peas (1).		
		(98) Lots of fluffy seeds.
Where found? Wetland and in grassy areas, replacing grasses.		Treatment <i>Conyza sumatrensis</i> is a pioneer, a ruderal weed, which should get overtaken by indigenous vegetation. In Kloofendal, however, it is overtaking the grasses, so pulling them out gives grasses more chance to come back. We have not tried this yet. Bromilow suggests the use of herbicides if <i>Conyza</i> becomes a problem (1).

ND

Cyathula cylindrica var. cylindrica

Family: Amaranthaceae

Common names: Burr weed

Herb

Origin: Tropical & S. Africa, Madagascar

Widely scrambling perennial, often covering surrounding vegetation. Its many tiny seeds are surrounded by burrs which cling to any animal brushing past it.



(55)

Small undulating, round leaves with reddish stalks and branches.



(55)

Where found?

Around Dassie Rock on Dassie Trail (red route). Burrs stick onto dassie fur, so seeds are easily spread.



(55)

Many very small flowers in a spike-like inflorescence, surrounded by dry, chaffy, spinescent bracts (which form the burrs).



(7)



(55)

Sepals 5, free, dry and membranous, no petals, 5 stamens opposite the sepals, filaments united at the base. Ovary superior, 1-chambered. Fruit dry, seeds shiny (8).

Treatment

Bag seeds, dig out the plants. No slashing as it will just come up again.

ND

Cyathula uncinulata

Family: Amaranthaceae

Common names: Ronde klits, Burr weed

Herb

Origin: Tropical Africa and South Africa, excluding Gauteng & Northwest province. (Wiki)



A perennial weed with burrs that contaminate hair & wool of animals with consequent downgrading (53)

Burrs on these plants often obstruct removing the declared Alien Invasive Plants, hence the need to remove them in order to gain access.

Where found?

In the wetland, below Dassie Rock, in the forest under trees.



The leaves are furry and soft, they come out opposite, a single burry seed ball is situated at the end of the stem, it comes off easily when mature. This plant is very invasive in Kloofendal, due to the seeds sticking onto anything that brushes past them.



Treatment

Preferably take the plant out before it seeds. If seeds are present, bag the seeds and dig out the plants.

No slashing as the plants will just come up again.

ND

Cyathula – species unknown

Family: Amaranthaceae

Common names: Ronde klits, Burrweed

Herb**Origin:** Indigenous

A perennial weed with burrs that contaminate hair & wool of animals with consequent downgrading. (53)



The seeds are smallish burrs that stick onto anything brushing past.

Where found?

In Magaliesberg around Hamerkop cottage. Tends to grow along rocky paths.

Treatment

Cut off the seeds and put into a bag.

Leave to rot inside the bag.

Pull or dig out the plant.

ND

Cynoglossum lanceolatum

Family: Boraginaceae

Common names: Forget-me-not

Herb

Origin: Yemen, Pakistan, India, Mediterranean, Asia and Madagascar, growing in disturbed habitats throughout parts of Africa widely in all S. African provinces (Wiki).



Many little blue flowers which become green fruits which dry out to become burr seeds which stick onto anything that comes past. They grow in the same disturbed areas where the declared AIPs grow, obstructing the removal of these plants.



Leaves bluish-green with distinct central and lateral veins.

Where found?

Wetland, disturbed areas such as along neighbouring fencing, along paths.



Taproot, which can get pretty big!

**Not to be confused with**

(7)

Nidorella hottentotica, an Asteraceae, which, unlike *C.lanceolatum* has fuzzy, grey leaves and yellow, daisy disc flowers.

Treatment

Bag seeds & flowers & pull out the plants. No slashing. Cut off flowers before seeds/ burrs appear.

Family: Solanaceae (Tomato family)

Common names: Common thorn apple, Malpitte, Olieboom

Herb

Origin: Tropical America

Erect annual herb, grows up to 1,5m high with sparsely hairy to smooth, green, brown or purple stems.



Leaves are dentate, dark green or purple on the upper surface and paler underneath. They are sparsely hairy and bad smelling.

Stems often purple, reddish.

Where found?

Found in sewerage spills together with *Mirabilis jalapa* (Four o'clock), *Cestrum parqui* and *Leonotis intermedia* (Wild dagga).



Solitary white, mauve or purplish funnel-shaped flowers appear from October to March.

Flowers open up untwisting themselves like the Convolvulaceae (Morning glory) family flowers.



(9)

(3)

Seed pods spiky, old pods become brown and hard. The mature pod will open and release black seeds.

The seeds are poisonous and hallucinogenic. The whole plant is poisonous. (9).

The flowers, fruit and leaves can be an irritant to skin. (3)

Treatment

Bag seeds, pull out and dig out plants. They come out quite easily as they have shallow roots.

ND	<p><i>Euphorbia heterophylla</i> <i>Euphorbia geniculata, Pointsettia</i> <i>geniculata</i></p>	
	<p>Family: Euphorbiaceae Common names: Wild pointsettia</p>	Herb
<p>Origin: North America and Mexico.</p> 	<p>Wild pointsettia has a poisonous milky sap that can irritate the skin.</p> <p>Treatment: Remove by hand. They come out easily.</p>	
<p>Wild pointsettia can be more than three feet tall, with a thin stem. Leaves can vary in shape and are clustered at the top, along with the flower parts. The flowers themselves aren't much to look at, but they are surrounded by bright reddish orange bracts.</p> 		
<p>Where found? Not in Kloofendal. Found in Magaliesberg in disturbed areas.</p>		

ND	<i>Galinsoga parviflora</i>	
Family: Asteraceae Common names: Gallant soldier, Knopkruid		Herb
Origin: South America		
Troublesome in wide range of crops in South Africa, but also in gardens. (1)		
		
Small white and yellow flowers. Flowers in summer		
Where found? Not really noticed in Kloofendal, but common in Johannesburg gardens.		
Host to some nematode (roundworm) species, as well as tobacco and cucumber virus (1).		
Treatment Easy to control, particularly after rain when the ground is wet, by pulling out.		

ND	<i>Heliotropium amplexicaule</i>	
Family: Boraginaceae Common names: No common name		Herb
Origin: South America, especially Argentina.		
Flat-growing perennial herb, hairy throughout. Stems lying horizontal with tips curving upwards.		
 (7)		
An umbel of small purple flowers with orange centre, flowering in summer. Slightly undulating pointed leaves with deep central and lateral veins.		
Heliotropes are toxic (1)		
Where found? In Kloofendal amphitheatre flowerbeds, also on southern upper slopes of Kloofendal amongst grasses and on disturbed ground, next to paths, mostly on dry, gravelly ground.		 Treatment Pull, dig out, not easy because of deep taproot, long roots coming off the tap roots and the suckering. Preferably done after rain when the ground is not so hard.

Family: Nyctaginaceae

Common names: Four o'clock, Vieruurtjies

Herb

Origin: Tropical America

Four o' clock is a bushy, tender perennial with tuberous roots that typically grows tall on erect, branching stems. It is an old garden favorite that features fragrant, funnel-shaped, tubular flowers with five flaring petal-like lobes. Flowers bloom from early/mid-summer to autumn. Flowers open in the late afternoon (around four o'clock) and stay open only until the following morning. (9)

It is capable of withstanding extended droughts due to the tuberous roots. **The seeds and plant are poisonous if ingested** (9)

It competes with indigenous vegetation (1)

Slightly pointed oval leaves which are situated opposite each other coming off multi-branched stems.

Where found?

In area south of the reserve near the top, below a big drain from the adjacent road, amongst dried out litter and in the Wetland area.



Flowers come in pink, red, yellow, white and some bi-coloured. They have a slight vanilla scent. (9)

Treatment

Unsuitable to remove with the tree popper as the stems are fleshy and break when trying to remove with the tree popper. Digging out is an endless task as the tubers are big and deep, and stems break off easily, we have not succeeded, so spraying with a systemic herbicide, as recommended by Bromilow hopefully would work (1).

I recommend digging out young plants when they appear, thereby not allowing them to spread. We have tried brush cutting the plants before the flowers produce seeds, but follow-up brush cutting with lack of workers is a problem.

Family: Nephrolepidaceae

Common names: Sword fern, Boston sword fern

Herb

Origin: Tropical forests all over the world, especially Central America & the West Indies.

Evergreen fern with ~ erect, stiff fronds (leaves) up to 1 m high; terrestrial or epiphytic (grows on other plants). (3)



It forms extensive colonies by means of stolons and produces tubers (3).



Tuber

(3)

Where found?

Kloofendal amphitheatre area in flowerbed.

Fronds tend to be dull green in shaded areas and lighter green or yellowish-green when growing in a sunny position.

Both fertile and sterile fronds are pinnately compound (once divided) and 7cm wide. Numerous spore containing structures are produced between the leaflet midvein and margin on the undersurface of the leaflets. (9)

Thousands of spores can be produced by one plant, which, enables this fern to spread aggressively, making it a threat to indigenous plant species. (9)

Not to be confused with

Nephrolepis exaltata, which has no tubers, and longer leaflets, 3 -7cm, compared to *N.cordifolia*'s leaflets of 2 - 4.5cm (3).

N. exaltata is also alien, from N. and C. America, most Nephrolepis cultivars have been derived from *N. exaltata*.

Treatment

Hand pulling, making sure all parts of the plant are removed (1).

ND

Physalis peruviana

Family: Solanaceae, Nightshade family

Common names: Cape gooseberry

Herb

Origin: Peru.

Cape Gooseberry was cultivated in the Cape for its fruit, but with the potential of it becoming weedy (1), which it is in Kloofendal.



(56)



(57)

Where found?

Wetland.



(58)

Fruit, initially green, turning orange when ripe, has a characteristic pointed balloon enclosing it. Ripe fruit is nice to eat.



(58)

Treatment

Pull out and enjoy eating the rip fruit.

Family: Phytolaccaceae
Common names: Inkberry

Herb

Origin: Mexico, Central and South America, West Indies.
(3)

This is an erect, short-lived perennial (living more than 1 growing season) herb with woody base, growing up to 2m tall. Stems are green with a reddish tinge, smooth and hairless. (9)



Flowers -white, to pinkish, small with 5 petal-like sepals, stalks 0.25 to 2 mm long in an erect spike up to 30 cm long (3)

Where found?

In disturbed ground.

Leaves: Green, elliptic to lanceolate, 30 x 15 cm long, stalk up to 6 cm long, margins entire, hairless, unpleasant smelling.



Fruits are shiny, purple-black berries, when mature, 7–8 mm across. ± 8 ribbed (tightly fused carpels), on flower stalks which are shorter than the berries. Fruit is on an erect raceme.

Fruit said to be poisonous and causing skin irritations, even though in some areas baboons and some birds eat the fruit and spread the plant this way . (9)

270

***Phytolacca octandra* (cont.)**

1b

Family: *Phytolacca octandra*

Common names: Inkberry

Herb

A fat taproot, which grows down deeply, difficult to dig or pull out!

Treatment

Dig out when plants are young. Tree popper to pull plants out does not work as the plants have fleshy stems, the popper just slips off. We try hacking it with a panga, also repeated cutting away new growth to eventually starve the plant.

ND

Plantago lanceolata

Family: Plantaginaceae

Common names: Buckhorn plantain

Herb

Origin: Europe

Pioneer following human disturbance (1)

Perennial herb with leaves in a basal rosette.



(60)

Flowers in terminal spikes, several per plant. (1)

Where found?

In disturbed places. Plentiful in Kloofendal lawn



(61)

Leaves are narrow with distinct parallel veins.



(62)

Flowers on a terminal spike i.e. flowers arranged along the end of the stalk. Anthers are protruding on long filaments.

Treatment

Bag flowers and seeds. Dig out.

ND

Polygonum lapathifolium/Persicaria lapathifolia

Family: *Polygonum lapathifolium/Persicaria lapathifolia*

Common names: Spotted knotweed

Herb

Origin: Europe

Widespread naturalized weed in South Africa, common on riverbanks, dam walls, ditches, even in water. (1)



(7)

Treatment

In ditches and watercourses *P. lapathifolium* should be removed manually, before infestation becomes severe. (1). Simply pull out.

Where found?

Grows in water in the dam and wetland, growing from the edges inwards into the water.

ND

Pseudognaphalium luteo-album

Family: Asteraceae

Common names: Cudweed, Roerkruid

Herb**Origin:** Europe, common, widespread

(7)

Leaves long and narrow, folded along the midriff longitudinally.

Grows in dense stands.

Flowers in summer.

Where found?

Southern upper rocky part of the reserve, in Wetland and amphitheatre lawn.

Not to be confused with*Helichrysum rugulosum* (7)*Helichrysum rugulosum* flowers in spring, whereas *Pseudognaphalium* flowers in summer.*Pseudognaphalium*'s leaves are longer than *H. rugulosum*.*Pseudognaphalium* is much taller than *H. rugulosum* and grows in dense stands.**Treatment**

Shallow cultivation (1)

ND	Pteridium aquilinum	
Family: Dennstaedtiaceae Common names: Bracken, Adelaars varing		Herb
<p>Origin: Indigenous to South Africa</p> <p>A perennial, deciduous fern, growing into dense stands. (1)</p>  <p>Bracken has large, roughly triangular fronds (large, divided leaf) produced singly from an underground rhizome, and grows to 0,3 to 1 meter tall. The plant dies back to ground level in autumn. The rhizome grows up to 3.5 meters deep, 5 cm in diameter, and up to 15 meters long (63)</p> <p>Where found? In Kloofendal Wetland area, and on western, lower part of reserve. In Magaliesberg near streams, also in open veld – walking up to Tonquani (Magaliesberg), on both sides of the higher section of the path.</p>	<p>It regrows in the spring from an underground rhizome, new growth presents as vertical stalks, coiled and covered with silver grey hairs, unfurling into fronds. (63) It also reproduces from its copious spores.</p> <p>Not to be confused with <i>Microlepia speluncae</i></p>  <p>(7)</p> <p>Treatment Difficult to control. Can be removed mechanically, by cutting stands repeatedly over six weeks cycles during active growing periods (1). Pulling and digging the plants out does not work, they simply break off from the rhizomes. Bromilow recommends systemic herbicides such as Imazapyr and Metsulfuron-methyl sprayed towards the end of the growing season (1).</p>	

Family: Lamiaceae

Common names: Lindenleaf sage

Herb**Origin:** Central America

Erect, shortly hairy, annual herb to 1.2 m high.



(7)

Leaves are simple, heart shaped, have finely serrated margins, in opposite pairs, each pair at right angles to the last (3).
Leaves are used to kill lice.



(9)



(9)

Blue flowers, corolla 5–10 mm long, calyx 4–7 mm long, in whorled clusters along a terminal spike up to 25 cm long (3).

Where found?

Spreading fast in Northern lower border of reserve and on western lower part of reserve next to paths. Mostly grows in shade.



Seeds are tiny and many, sown in spring.

Not to be confused with



(7)

Plectranthus hereroensis, which has far more coarsely serrated leaf margins and grows as a higher herb.

Treatment

Pulling out plants loosens the soil facilitating germination of the many seeds. We are experimenting by cutting the plants preferably before they seed, preventing seeding, and keeping ground “occupied”. Another suggestion is, as the Salvias appear to like to grow in the shade under trees, is, to see if they survive when trees and shrubs they are growing under, are removed as part of Bush encroachment strategy.

Family: Solanaceae

Common names: Silverleaf-bitter apple, Satansbos

Herb

Origin: North America and South America

A troublesome Weed. (8)

An herbaceous shrub growing to up 60cm high with felty stems and deep, spreading roots. The stems and undersurfaces of the leaves are covered with white or silvery, felt-like hairs. Orange or reddish prickles on the stems and undersides of the leaves.



Greyish or silvery-green leaves, often wavy and folded upwards along their midribs. (9)

Where found?

In disturbed areas



(9)

Mauve, blue or white flowers. Stamens stick out, petals reflexed, typical of Solanum family. Flowers in spring.



(65)

Fruits are shiny green berries with white patches turning yellow.

Young fruit and leaves are poisonous.(3)

Treatment

Pull, dig out.

Family: Solanaceae

Common names: Jerusalem cherry

Herb**Origin:** Mediterranean Europe, Madeira

Perennial, evergreen up to 2 meters high shrub.



(66)

Tiny white flowers, petals recurved, with yellow stamens protruding forwards. Flowers in summer.

Where found?

All over lower parts of the reserve, in wetland and under trees.



Leaves, when crushed, have an unpleasant smell.

Berries initially green, ripening to bright orange, **mildly poisonous to humans, but highly poisonous to domestic animals and some birds.**

Palatable to some birds who feed on the fruit and disperse the seeds. (5)

Treatment

Pull or dig out plants before they fruit, using a tree popper. If fruit is present, remove fruit before cultivation.

Family: Solanaceae

Common names: Wild tomato, Dense-thorned bitter apple

Herb

Origin: S. America (Brazil, Argentina, Uruguay & Paraguay)

Much-branched, very spiny, low shrub 0.5–1.5 m high, with extensive root system. (3)



(9)

Leaves deeply, pinnately lobed, covered with star-shaped hairs and the midrib and stalk have straight reddish-brown spines. (9)



(9)

Stems are densely covered with slender, reddish brown straight spines up to 30 mm long.

Where found?

On rocky quarzitic, disturbed ground, on firebreak path between yellow and red trails

Flowers



White form



Blue form (7)

Flowers all year round (3)



(9)

Fruit is a bright red berry with its calyx being enlarged and spiny.

Treatment

Pull out, dig out, use thick leather, elbow length gloves for protection against thorns. Tree popper works well.

ND	<i>Tagetes minuta</i>	
Family: Asteraceae Common names: Tall khaki weed, Langkakiebos		Herb
Origin: South America		
 Leaves, flowers and branches have a strong, distinctive smell.		Treatment If few, bag seeds & flowers & pull-out plants. If lots, see treatment for Black Jacks.
Where found? Any disturbed area, usually together with Black jacks.		

ND

Triumfetta Pilosa

Family: Amaranthaceae

Common names: Burr weed

Herb**Origin:** India

An alien perennial weed with burrs that contaminate hair & wool of animals .



Small yellow tubular flowers



Serrated leaf margins, rough hairy leaves with raised venation below.

Where found?

Not in Kloofendal, but very invasive burr weed along streams in Magaliesberg.

The seeds are burrs stick to anything brushing past it.



Burrs initially green, turning black when old, seeding in autumn.

**Treatment**

Bag seeds, remove plants with the tree popper, it works well!

Family: Verbenaceae

Common names: Tall verbena

Herb

Origin: South America



(3)

Tall verbena is a flowering herb with erect stems up to 2m tall which are noticeably square in cross-section and rough. (9)



(9)

Leaves are stalkless and clasp the stem at the base (i.e. do not narrow at point of attachment), thick textured, strongly veined beneath and the margins are sharply toothed. Stiff hairs on the stem and leaves make them rough to touch.

Where found?

In the wetland.



(3)

Flowers are purple, 40mm long, in congested terminal spikes. The flowers stand out above the inflorescence and appear during summer.



(7)

The small fruits separate into four brown, elongated seeds when mature.

It is **poisonous to livestock** and invades roadsides, disturbed places, moist areas and grasslands. (9)

Treatment

Pull, dig out. Wear leather gloves as stems are rough like coarse sandpaper.

Family: Verbenaceae

Common names: Brazilian verbena

Herb

Origin: South AmericaAnnual or perennial herb,
sparsely branching, with erect,
4-angled stems to 2 m high.

(3)

Stems and leaves have minute,
stiff, appressed hairs, becoming
hairless and smooth.

(3)



(3)

Leaves are narrow-ovate, 4–5 x 1 cm, they are stalkless and leaves narrow at the point of attachment to the stem, not clasping the stem. The margins are coarsely toothed.

Where found?

Kloofendal Wetland.



(7)

Flowers of *V. brasiliensis*
Inflorescence, consisting of small purplish-blue flowers with a long, slender corolla tube, the flowers are crowded at the tip of the inflorescence. It flowers all year. Not to confuse with: *Verbena bonariensis*, which is more common, a stronger and stiffer plant. with rough hairs on stem and leaves .
Leaves clasp the stem.
The inflorescence of *V. bonariensis* is denser and more robust than that of *V. brasiliensis*.

Treatment

Pull, dig out. Wear leather gloves as stems are rough like coarse sandpaper.

Family: Asteraceae

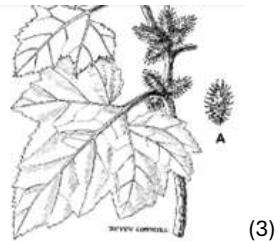
Common names: Large cocklebur, Kankerroos

Herb

Origin: South America

This herbaceous shrub grows up to 1,2m high. The erect stems are brownish or reddish-brown, often with red spots, ribbed and roughly downy

Leaves are blue-green, sparsely hairy above and densely white-woolly below, entire or three-lobed, ± lanceolate, up to 60 mm long x 20 mm wide.



Three-lobed leaf and very prickly burrs.

The large cocklebur is a **common, poisonous and serious weed** in land used for growing crops, it is competitive, and the burs contaminate sheep's wool. It is a major pest to various annual crops (1).

Where found?

Not in Kloofendal Nature Reserve.

Plentiful in Klipriviersberg along stream edge.

Flowers are greenish, inconspicuous in axils of leaves, flowering from October to April (3).



(9)

Green burrs which will turn brown. Brownish burrs up to 2cm long crowned with two stout horns and covered with hooked spines up to 4mm long (3). The burrs are an irritant to the skin, the prickles are sore.

Treatment

Hard to control but can be controlled by shallow cultivation during the seedling stage or with post emergence herbicides, however there are usually late germinators who escape the treatment and will form seeds. Cultivation needs thick leather gloves and boots – the spines are serious. (1)

ND	Zinnia peruviana	
Family: Asteraceae Common names: Redstar zinnia		Herb
Origin: South America		Treatment Cultivation during the seedling stage
 <p>Annual weed of waste places, roadsides, next to paths.</p> <p>Flower heads solitary, terminal on stalks. Ray flowers red or pale orange, persistent, drying out to brown.</p> <p>Flowers in summer.</p> <p>Where found? Disturbed areas. In Kloofendal it is found next to path yellow trail on the west side, also on the north side.</p>		

ND

Alternanthera pungens (A. repens)

Family: Amaranthaceae
Common names: Paperthorn,
Khakiweed

Flat-growing herb

Origin: South America

A prickly, creeping perennial herb with a taproot that can become large and woody. It can form large mats which are difficult to remove.



(67)

Paperthorn has large taproots and roots at the nodes, forming large mats – it is a weed of many different crops. (1)

Where found?

In Kloofendal lawn. Plentiful in Pilanesberg campsite.



(67)

Burr/ seed

A very unpleasant weed as the seeds can penetrate bare feet, even stick to rubber-sole shoes (1)

Treatment

This weed should be removed when small.
Bromilow recommends pre-emergence herbicides. (1)

ND

Dicerocaryum eriocarpum

Family: Pedaliaceae

Common names: Devil's thorn

Flat-growing herb

Origin: DRC, Botswana, Namibia, Zambia, Zimbabwe, South Africa



Mat-forming perennial herb with long trailing shoots from a woody rootstock.



Leaves opposite, deeply lobed, upper surface grey green, under surface white. (8)

Leaves opposite, deeply lobed, upper surface grey green, under surface white. (8)

Where found?

At entrance of Kloofendal Wetland.

Found in grassland, particularly in trampled areas and abandoned fields.



Pink flowers with five petals which are united, slightly two-lipped and irregular.

Fruit is a flat, elliptic very hard disc lying on the ground with two vertical spines sticking out from the near centre of the upper side. (8)

Not to be confused with

Graderia subintegra which also has a trailing shoots from a woody root stock, but leaves come alternately.



Leaf shape is trilobed. The pink flowers are similar, but the lower surface is whitish.

Treatment

As *D. eriocarpum* is not invasive, there is no need to remove it, but it can be problematic as its thorny seeds in a lawn can cause harm to barefooted people, people should be warned to be careful.

121

Duchesnea indica

1b

Family: Duchesnea indica

Common names: Wild strawberry

Flat-growing herb

Origin: India, Sri Lanka

Creeping perennial herb spreading by slender stolons, grows in damp, shady places. It tends to spread rampantly, blocking drainage lines and replacing other species (1)



(68)

Leaves trifoliate, fruit red small strawberry, which is edible but has hardly any taste.



(69)

The flowers are yellow.

Where found?

Wetland.

Treatment

Pull, dig out

Family: Polygonaceae
Common names: Pink knotweed

Flat-growing herb

Origin: Asia

Knotweed is a mat-like, perennial, herbaceous plant with a slender, woody rootstock and long, creeping, rooting stems. It also spreads with seeds.

It is found growing on roadsides, dry banks, slopes and in open areas, preferring full sun. It negatively impacts on the environment by forming a dense carpet, replacing most indigenous vegetation. (9)



The hairy leaves are 1-6cm long and 0.7-3cm wide with a reddish midrib and a distinctive dark red V pattern. The leaves turn red when the plant is under stress. (9)

Where found?

Stream crossing on north-east side of reserve.



(9)

The tiny pink flowers are clustered in ball-shaped flower spikes above the foliage. These ball-like inflorescences are 7-20mm across with numerous pink flowers 2.5mm long. Flowering occurs from October to March. (9)

This plant was brought in as an ornamental groundcover and is one of the many garden escapees found in Kloofendal.

Treatment

Pull/ dig out

ND

Richardia brasiliensis

Family: Rubiaceae

Common names: Tropical Richardia,
Paper thorn**Flat-growing herb****Origin:** South America

(70)

Leaves come off opposite, have parallel venation and many tiny white flowers.

**Where found?**

Kloofendal lawn has been taken over in large parts by *R. brasiliensis*, also spreading on paths leading away from the amphitheatre.

Richardia grows very low on the ground, creeping under the grass and replacing it. It grows in very dense clumps and can survive the effects of continuous mowing.

Not to be confused with

Other ground covers in the Kloofendal lawn.

Treatment

Mechanically. Pull out, dig out
For long-term management of lawns:

- (i) Fertilise lawn to give grass strength to compete against weed.
 - (ii) Water when needed.
 - (iii) Set lawnmower higher to allow grass to grow and seed.
 - (iv) Apply a broadleaf herbicide.
- (71)

Family: Commelinaceae
Common names: Wandering Jew

Flat-growing herb

Origin: Mexico

Wandering jew is a trailing perennial. It forms a mat which smothers low growing plants and prevents the natural regeneration of taller forest species.



(74)

Grows in shade, under trees, forming extensive mats, that smother all other vegetation and eventually replace it.
(Bromilow, c. 2018. p 346)

It's stems break easily at the nodes and establishes itself again.

Where found?

Wetland.



(73)

Flowers bloom intermittently throughout the year.



(72)

It often causes skin irritations in humans, and dogs kept in yards containing Wandering jew have developed rashes. (9)

Treatment

Foliage is easy to remove, but this must be done repeatedly, and care taken that all stem fragments and roots are removed. (1)

Family: Apocynaceae

Common names: Greater periwinkle

Flat-growing herb

Origin: Western Mediterranean

Perennial, evergreen herb with erect flowering stems to 450 mm high. This species prefers shaded habitats and is a weed of urban bushland, open woodlands, watercourses (i.e. riparian areas), roadsides, gardens, disturbed sites and waste areas



(3)

Leaves are green, sometimes with creamy margins, glossy, ovate, 25-60 mm wide.

Spreads vegetative by its creeping underground and above ground stems

Poisonous

Where found?

In streambed above the dam and in the wetland.



(9)

Flowers are blue-violet, sometimes white, 30-50 mm wide with five spreading lobes, solitary in leaf axils. Flowers appear during summer.

Longer distance dispersal can occur when stem segments and seeds are spread by water, in contaminated soil, or in dumped garden waste.

Treatment

Pull out.

Family: Bignoniaceae

Common names: Mrs River's hybrid
Mexican blood trumpet

Creeper

Origin: Mexico



A large alien creeper, creeping high up in tall trees, with rhizomes and stolons creeping over the ground, shooting down roots all over into the compost ground. The old plants have thick stolons and rhizomes running along the ground and high up into the trees, growing over indigenous vegetation, smothering it.

Where found?

Not in Kloofendal. On a forest floor area near a stream in Magaliesberg, climbing right up the highest trees.

A pair of leaves comes off the branch opposite each other. In young branches often a tendril comes off at that intersection which winds itself onto its host plant.



Pink tubular flowers, flowering in autumn.

Not to be confused with

Mexican Blood Trumpet (*Amphilophium buccinatorium*), also alien, which has the same flowers but red and orange in colour.



Treatment

Remove by pulling up rhizomes & stolons from the ground, cut into pieces, stack up in piles to reduce chance of roots growing into the soil again. Saw/ cut creeper stems going up into the tree.

Family: Apocynaceae (Asclepiadaceae)
Common names: Moth Catcher

Creeper

Origin: South America

A vigorous climber growing to 5m or higher, overtopping and smothering other species.
Leaves are dark green and smooth above and pale green or whitish below with short, dense hairs.



(9)



White, cream or pale pink flowers appear from November to April

The seeds and milky latex are poisonous, the latex can cause skin irritation.

Where found?

In forest, where it can climb up into the trees. Also, near tall fences, such tennis courts.



Big green seed pods, which turn brown and woody and split to release with numerous fluffy seeds



Not to be confused with

Pentarrhinum insipidum which also has a milky latex and similar, but a smaller seedpod with fluffy seeds but the leaves are heart shaped.



Treatment

Dig and pull out. Remove seed pods before they ripen. If you can't get the roots out, simply cut base of creeper stem, to stop it producing seed.

Family: Convolvulaceae

Common names: Common dodder

Creepers

Origin: North America

Slender, leafless, parasitic herb with yellow or whitish, twining stems up to 2m high and forming dense patches up to 6m across.



It smothers and parasitizes other plants of economic importance in agricultural crop lands.

Dodder has no leaves and no chlorophyll in its stems either, so is totally parasitic on its host plant.

Where found?

Along northern and western border of Kloofendal.

Leafless annual herb, looks like entwined yellow string creeping plentifully over other vegetation from which it parasitizes by suckers (hausteria).



(9)

Tiny white flowers in compact, globose clusters



(9)

The flowers produce greenish-yellow fruits approximately 3mm long

Treatment

Cut out and burn infected plants before Dodder can produce seeds .

Family: Bignoniaceae

Common names: Cat's claw creeper

Creeper

Origin: South America

A fast growing, frost and drought tolerant creeper climbing as high as 9m with claw-like tendrils between the bright green oblong to lance-shaped leaves.



(9)

Masses of yellow trumpet-shaped flowers appearing in spring.

It develops resilient tuberous roots from which new plants can grow.(1)

Where found?

Not in Kloofendal but in numerous Johannesburg gardens and on roads verges, open areas overgrowing big trees.



(87)



(3)

Long, slender pod-like seed capsules (C) that split open to release papery winged seeds (D).

Not to be confused with
Yellow Jasmine (*Jasminum mesnyi*) also an invasive alien creeper, but not declared.
Flowers are flat, not tubular.



(7)

Treatment

Cut older plant at ground level.
Dig out the tubers – difficult as they break easily. (1)

Family: Araliaceae

Common names: Canary ivy

Creeper

Origin: Europe

This evergreen perennial can climb up to 10m high by means of rootlets on the stems, or it can spread over the ground to form a carpet.



(9)

All parts of the plant are poisonous and the sap an irritant to the skin. (3)

Cultivated as an ornamental and as a ground cover. (9)

Where found?

Not in Kloofendal but all over in Johannesburg in gardens, on pavements, on roadsides.



(9)

Leaves are bright to dark green, sometimes with broad silvery-grey or white edges, glossy when new, becoming leathery with age. They are mostly wider than they are long, unlobed to shallowly three-lobed.



(9)

The flowers are green in terminal, globular umbels flowering from March to July, but seldom appear. Fruits are drupes, which are black when ripe. (9)

Treatment

Stems of ivy climbing on trees can be cut and above the cut, be pulled away from the tree or wall for a few meters. The ivy above the cut can be left to rot, it will die if not rooted in the ground. The remaining base should be treated with herbicide (1)

Family: Convolvulaceae

Common names: Morning glory

Creeper

Origin: Tropical America

Sterile cultivars or hybrids are not listed.

A slender creeper, it climbs up on trees, not along the ground, twining to 3 meters and more, competing with other species. It is an annual plant, has less impact than the similar *Ipomoea indica* which is perennial. (9)



(7)

Bright green, sparsely hairy, heart-shaped leaves.

Purplish-blue, reddish, magenta or white flowers, sometimes with contrasting stripes, funnel-shaped, to 85mm long. (9)

Where found?

In disturbed ground, creeping over or on other vegetation.



Flowers usually appear November to May.
The flowers produce globose seeds, capsules of 10mm measured across.
The seed is said to contain a powerful hallucinogen. (1)

Not to be confused with

Not to be confused with other Ipomoeas such as the indigenous *Ipomoea ommanney*, which has thick, hairy leaves and crawls over the ground.



Treatment

Pull plants out.

Family: Oleaceae

Common names: Yellow jasmin,
Primrose jasmin

Creeper

Origin: Southwestern China.

Primrose jasmine is a rambling, open evergreen shrub with long, slender, arching stems that will climb like a sprawling vine if given support. The stems are square in cross section, and green, becoming woody with age (Wiki).



(7)

The glossy dark green leaves are opposite and divided into three leaflets.

Where found?

Primrose jasmine is found growing profusely between the neighbouring fence bordering houses on Galena Street and the path leading from the wetland east wards.



(7)

The fragrant, yellow trumpet shaped flowers are borne in early spring and sporadically into summer. They are semi-double with 6-10 petals, and sweetly fragrant.

Not to be confused with
Dolichandra unguis (Cat's claw)

Treatment

Pulling and digging out the entire plant & root system, a big task, we have not managed to do so in Kloofendal. It has been cut back as part of the firebreak management between neighbouring properties and Kloofendal.

Family: Oleaceae (olive)

Common names: Jasmin

Creeper

Origin: West China

An evergreen vigorous climbing vine that grows up to mid-canopy height.



It has very long, non-woody, round, tough, stems that root at the nodes.



Smooth edged leaves are arranged in opposite pairs on stems and are divided along the midvein into usually 7 leaflets with the terminal leaflet (up to 7 x 2.5 cm) the largest. Leaves are dark green when mature, new growth is tinged with red.

Where found?

Northern border along neighbouring fence and creeping over trees and bushes.



It has masses of highly scented, small white tubular flowers, flowering mainly in spring followed by occasional glossy black fruit.

Treatment

Vines must be pruned as close to original stem as possible, and then the cut stem immediately treated with paint-on herbicide – see website link. We would try Kaput as that is the only herbicide we use at present.

Vines can be progressively rolled up and disposed off at a refuse transfer station or by drying thoroughly and composting, or drying and burning, or burying deeply. Stem fragments must be removed as they, left in soil after rolling, will re-sprout. If so, these resprouted plants need to be pulled out manually. (88)

Family: Caprifoliaceae

Common names: Honeysuckle
(Japanese)

Creeper

Origin: Eastern Asia including China, Japan and Korea.

An aggressive climber which develops a mass of extensive underground runners and stems that spreads over the ground and climbs up trees for many meters smothering plants underneath it. It invades woodland and riverbanks, usually close to urban areas. (1) It blocks sunlight with their dense canopy and eventually pulling down their dead hosts with the weight of the vine. (9)



(9)

Flowers and fruit are prolific.

Uses:

It is an effective groundcover, and has pleasant, strong-smelling flowers. (9)

Where found?

On and around boundary fencing in the reserve on the north side



(3)

Flowers of Japanese honeysuckle are in axillary pairs with corolla 1.5-5 cm long.



(3)

Opposite, simple oval leaves 3-8 cm long.

Not to be confused with

Other garden plant creepers. Without flowers it can be easily confused.

Treatment

For small infestations, repeated pulling and digging out the entire plant & root system. Herbicides are moderately effective (1)

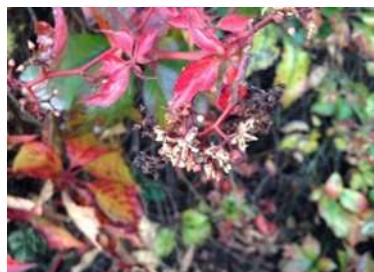
Family: Vitaceae

Common names: Virginia creeper

Creeper

Origin: USA

A vigorous large deciduous climber, invasive, overrunning indigenous vegetation.



Leaves in autumn turn red, flowers inconspicuous; berries blue-black.

Treatment

Cut and pull out, follow up by pulling out new growth.

Leaves in summer – green, five ovate fingers.

P. quinquefolia is a Greek name. “*Parthenocissus*” from Greek means “virgin ivy” – “*inquefolia*” means five-leaved.

Where found?

Virginia creeper was smothering the big indigenous *Leucosidea sericea*s on the northern border of the reserve, below the wetland.

In Johannesburg it is found growing over trees, hanging down obscuring pathways next to the road, growing onto the road, making it hazardous for pedestrians to walk there.

Family: Bignoniaceae

Common names: Zimbabwe creeper,
Port St Johns creeper

Creeper

Origin: Tropical regions South America - difficult to find its real origin.



A vigorous, woody, rambling, evergreen. It sends up many tall strong stems — 3 to 5 m up to 10+ m high if left unchecked. It has many underground stems with newly sprouting plants coming up (89), like in Kloofendal, from gardens of neighbouring houses. The roots grow into the cement between bricks of brick walls, seriously damaging these walls.

Where found?

Creeper on northern side of wetland and eastern side of reserve coming from neighbouring gardens.

Podranea ricosaliana has glossy foliage and large bunches of fragrant lilac-pink, trumpet-shaped flowers.



The fruit is a long, narrow, straight, flattened capsule.

Moderately poisonous.

Treatment

With a large infestation from a neighbouring property, we are experimenting cutting basal stems of the creeper, pulling the branches away from the wall, then leaving cut branches to dry out on top of the stem remains and roots, and when dry burn them and hopefully the numerous sucker plants will burn too.

If unsuccessful, use foliar spray on the suckering plants.

The suckering plants have impressive roots of their own but can be dug out, but this takes a lot of manpower.

Family: Polygonaceae

Common names: Red sorrel, Arrow-head vine

Creeper

Origin: Indigenous to South Africa.

Rumex sagittatus is a soft-stemmed herbaceous scrambling and climbing herb which scrambles quickly over plants smothering them. It has prominent triangular arrow-shaped leaves. The grooved green stem may be distinctly tinted red at times (Wiki).



(78)

The small pinkish flowers grow on panicles up to 15 cm long. These are followed by a 3-sided greenish 1 cm diameter pod. The leaves and young stems can be cooked and eaten and are sometimes cultivated as a vegetable in Java (Wiki).

Where found?

Disturbed areas, next to path western, lower part of reserve near little cottage.



It has a tuberous woody rootstock with extensive rhizomes.

It spreads by seed and by resprouting from the tuber.

Not to be confused with



Pentarrhinum insipidum (Donkieperske), which also has heart shaped leaves, it has milky latex, and a seed pod with fluffy seeds.

Treatment

Bag seed and dig out tubers.

Family: Solanaceae

Common names: Potato creeper

Creeper

Origin: Tropical America

A slender herbaceous or woody climber growing 2-3m high. It creeps over indigenous bush and smothers them. (9)



(3)

Bright green leaves that are thinly textured and deeply lobed into leaflets. (9)

Where found?

Not seen in Kloofendal, but occurs in forested areas of Magaliesberg, in disturbed ground.



(9)

Sprays of nice smelling lilac flower with yellow stamens sticking out, flowering from December to March.



(9)



(3)

Small, shiny berries that go from green to bright red as they mature. Plant reproduces only by these berries. **Fruit, leaves and stems are toxic to mammals, exception of some birds, who enjoy the berries.** (9)

Treatment

Follow stem down until roots have been located, then pull or dig out.

Remove berries and bag them. Leave to rot in bag in the sun. (5).

Family: Agavaceae

Common names: American agave, Spreading century plant

Succulent

Origin: Mexico

Succulent shrub with basal rosette of thick heavy leaves up to 2 meters high. Leaves often reflexed. Flowers on an upright stem 5-9 meters tall . (9)



(9)



This plant spreads laterally via suckers and can form very large and dense colonies over time. The seeds are also dispersed by both wind and water.(9)

Where found?

Upper southern border of reserve on rocky ground.



Succulent light grey leaf with toothed margins and a terminal spine.

The variegated forms have grey to dark green leaves with yellow or white margins or a central stripe. (9)



(9)



Upright flowers (7-10.5 cm long), yellow or greenish-yellow in colour, each have six very prominent stamens.

Seeds are in a capsule, which is 40 mm long.

Treatment

Injection of concentrated MSMA into Sisal bole. When dead and dried, it can be burned (1). In Kloofendal we dig out small plants, and use panga to hack off leaves and damage the core of big plants.

Family: Agavaceae

Common names: Caribbean agave, Century plant, Narrow-leaved century plant.

Succulent

Origin: Native to Mexico and Central America



A long-lived shrubby plant forming large rosettes of leaves up to 1 m tall and 1.5 m across.



(79)

(80)

Rigid leaves with prickly margins and a pointed tip with a large dark brown spine (1.5-3.5 cm long) (90).

Where found?

Rocky section on northern border of reserve near neighbouring fence.

Mature plants produce a massive flower cluster (1-2 m long) on a robust flowering stem 3-5 m tall (90).

Greenish-yellow flowers, 5-6.5 cm long, borne in upright position and have 6 very large protruding stamens. (80)

The fruit are capsules which turn from green to dark brown or blackish in colour as they mature and eventually split open to release their seeds.

A. angustifolia reproduces by seed, but most of the reproduction is probably vegetative. It produces numerous suckers and often also develops plantlets (i.e. bulbils) on the branches of its flower clusters (90)



(81)

Treatment

For small infestation, we have dug out the small Agaves and used a panga to hack off leaves and damage the core of the adult plant.

Family: Crassulaceae

Common names: Chandeliers plant,
Mother of thousands

Succulent

Origin: Madagascar



A very distinctive succulent herb growing up to 1,2m with toothed grey-green leaves with dark-green to reddish spots. (9)

It reproduces rapidly from small plantlets which are produced at the tips of leaves. Care must be taken not to knock these plantlets off when clearing plants. (3)

It competes with indigenous species and is **very poisonous to humans and animals.** (9)

Where found?

Rocky area upstream from the dam.



Tomato-red flowers pendant at the top of an erect stalk, flowering during June and July.



It produces small fruits with numerous seeds.

Treatment

Unwanted plants should be uprooted and totally removed. (1)

Family: Cactaceae

Common names: Queen of the night

Succulent

Origin: Brazil

C. jamacaru is widely invasive across the savanna biome in South Africa and is taxonomically similar to, and difficult to distinguish from, other tree cacti in the *Cereus hexagonus* complex. (9)



Tree-like cactus with sharp, little thorns, no leaves, only many stems. These stems are green to blue-green, often powdery when young, with 4–12 prominent ribs, sometimes broken and wavy in monstrous forms. (3)

Where found?

Southern border of the reserve, adjacent and in neighbouring garden



Spines are in groups of 5–10



(3)

(9)

Flower buds – the flowers open at night into white flowers. (9) Fruits are yellowish, Orange, pink or red, succulent berries, ± 6 cm long, white inside with small, black seeds. Its fruits can be eaten dried or made into a juice. (9)



New plants grow from the thorns on each cladode .

Family: Cactaceae

Common names: Queen of the night

Succulent**Not to be confused with**

Euphorbia ingens (Naboom),
whose cut stems, unlike *C.
jamacaru*, exude a milky latex.



(93)



(93)

Treatment

Small plants – squash with boot or rock, or uproot (handle by roots) and hang up securely to dry out in fork of tree. Large plants – infest with mealybug, *Hypogeococcus festerianus*. Once infested a large plant may take up to 3 years to die, but will no longer produce viable seed, and will remain a source of the biocontrol agent in the infested area. (5)

Option 2. Chop down, but the stem base must be dug up and the broken stems must all be checked for regrowth. It should then be buried deeply or burnt. Or sprayed or injected with MSMA. (1)

Family: Cactaceae

Common names: Prickly pear (sweet)

Succulent

Origin: Mexico

Flattened leaf-like stems (cladodes) are grey to grey-green and are much longer than broad, varying from heavily spined to spineless.

The leaves are minute. (9)



(9)



The yellowish, turning into reddish, edible fruit is covered with minute spines (glochids) which are highly irritating to the skin (4).



(9)

Bright yellow or orange showy flowers appear from October to December. (9)

Dense infestations reduce the grazing potential of the land, causing drastic devaluation of agricultural land conservation land. The spiny cladodes can cause injuries to animals and during the fruiting season the minute spines (glochids) on the fruits can be highly irritative and can result in animals being unable to feed. (9)

Where found?

Southern top part of reserve

Family: Cactaceae

Common names: Prickly pear (sweet)

Succulent

Treatment

(i) Biocontrol with cochineal is successful in Kloofendal but needs to be spread over more cacti.



(ii) Small plant – squash with boot or rock
(iii) Large plant – cut roots with a knife, kick out with boot, pick up with stick and wedge into tree or crack in rock (it will root if left in the soil) (5).

Family: Cactaceae

Common names: Prickly pear (Aaron's beard)

Succulent

Origin: Mexico

Spiny, succulent shrub 3–4m high. The stem sections are flattened (cladodes) with a velvety surface, up to 25 x 12 cm in size. There are 1–6 spines per group, the radiate outer spines are yellow, 1–2 cm long, the central spine is white, flexible, deflexed, up to 7.5 cm long, giving older cladodes a white, bearded appearance. (3)



Cladodes densely covered with spines.

Rambling growth.

Where found?

Southern upper border of reserve, adjacent to neighbouring fences

This cactus propagates easily from the leaf pads or cladodes. Even a small piece lying on the ground can grow roots and flourish.



Flower buds sprouting out of each cladode.

Flowers are yellow, ± 5 cm across.

Fruits are yellowish green, 4–6 cm long, spineless or with wispy, threadlike spines.

Spines and glochids (minute spines) are an irritant to the skin
(3)

Not to be confused with
Other Prickly pears

Treatment

As for *Opuntia ficus indica*

Family: Brassicaceae

Common names: Watercress, Bronkhorstslaai

Waterweed

Origin: Europe

Perennial, aquatic herb with erect, creeping or floating, hollow stems up to 1 m long, rooting at the nodes, and mat-forming.



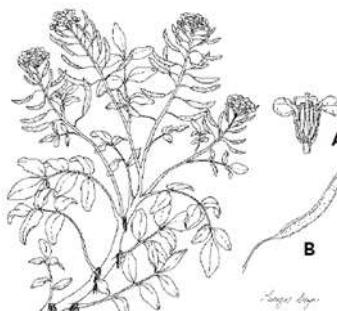
(3)

Bright green, pinnate with 3–11 leaflets, terminal leaflet often larger than the laterals; margins entire, somewhat fleshy. (3)

Cultivated for food
i.e. salads and garnishing

Where found?

Not in Kloofendal as there is not much perennial water, but there is plenty in the Walter Sisulu National Botanical Gardens' stream



(3)

Flowers are white
(A), 5 mm long, in terminal, elongated racemes, flowering September to March.

Fruits are brown, linear-cylindrical, 2-valved (B), curved upwards. (3)

Not to be confused with

The indigenous species which has leaves that have toothed or deeply divided leaves and yellow, not white flowers.

Treatment

To be removed by hand (1)

Family: Iridaceae

Common names: Yellow flag, Geel iris

Waterweed

Origin: Europe, North Africa, Asia.



(9)

Perennial, rhizomatous, clump-forming, aquatic herb up to 1m high, sometimes forming floating mats. (3)

Brought in as an ornamental plant.



(9)

Leaves blue-green, flattened with a raised midrib, lanceolate, up to 1 m long, 3cm wide. (3)

Where found?

Where found?

In the Kloofendal wetland at a freshwater perennial spring.



(9)

Yellow, showy, large, flowers with 3 narrow and 3 broad, petal-like lobes up to 7.5 x 4 cm, flowering October to November. (3)

All parts are poisonous, especially the rhizomes. The sap can be an irritant to people's skin (3)

Fruits are glossy green, 3-angled capsules, 4–8 cm long (3).

Treatment

Pull and dig out but beware that the sap may irritate the skin.

Glossary

Androecium	Stamens in a flower together form the androecium
Apex	Referring to a leaf – Apex is the top, base is bottom part of a leaf.
Axillary	Referring to leaf or flower or thorn coming off between leaf and stem (axil).
Basal stem Treatment	Refers to application of herbicide to root crown, exposed root and stem up to 25cm high of growing tree or shrub (1).
Biennial	A plant that requires two summers for development, with a winter in between. The vegetative phase in the first year and the reproductive phase in the second year (1).
Bisexual	In bisexual plants, the flower contains both the male and female parts.
Calyx	Sepals of a flower together form the outer ring, called a calyx.
Carpel	Flower ovary.
Carrying capacity	Of an environment is the maximum population size of a biological species that can be sustained by that specific environment given the food, habitat, water and other resources available (Wiki).
Coppicing	Regrowth from a stump or stem that has been cut.
Corolla	Ring of petals of a flower together form the corolla, forming the inner ring of leaflike appendages of a flower.

Glossary (cont.)

Culm	Referring to grass – parts which bear the leaves and inflorescences (7).
Cultivation	Turning or disturbing the soil to destroy weeds (1).
Cut-stump	Referring to herbicide application to the surface of a freshly cut tree stump.
Dioecious	Male and female flowers of a species growing on separate plants.
Epiphyte	An epiphyte is a plant or plant-like organism that grows on the surface of another plant and derives its moisture and nutrients from the air, rain, water or from debris accumulating around it. The plants on which epiphytes grow are called phorophytes. (Wikipedia)
Forb	A herbaceous flowering plant other than a grass, a broad-leaved, non-woody plant.
Glochids	Hair-like spines or short prickles, generally barbed, found on the areoles of cacti in the sub-family Opuntioideae. Cactus glochids easily detach from the plant and lodge in the skin, causing irritation upon contact.
Gynoecium	Ovaries of a flower, whether one or multiple, are called a “gynoecium”.
Herb	Plant not woody, but soft and leafy.

Glossary (cont.)

Herbicide	A substance for controlling weeds.
Hermaphroditic	In plants, hermaphrodites are known as complete (or bisexual) flowers. Complete flowers have stamens, pistil, petals and sepals.
Indigenous	Native or originating from a place.
Invader	A species that is not indigenous to a particular area and encroaches on or replaces the natural vegetation. (96)
Latex	Milky juice in some plants.
Monoecious	Male and female flowers of a species growing on the same plant.
Odiferous	Having an odour or fragrance (Wiki).
Ovate	Referring to leaf shape – leaf shape looks egg-shaped.
Petal	Colourful leaflike appendages of a flower.
Petiole	Leaf stalk.
Pistil	Female organ of a flower which will produce the fruit and seeds, comprising of the ovary, style and stigma.
Pinnately compound	A compound leaf once divided.
Pod	A type of fruit that splits longitudinally in two halves.

Glossary (cont.)

Raceme	Referring to grass: Part of an inflorescence in which the spikelets are borne on stalks (8).
Rhizome	A creeping underground stem which sends up new leaves and stems each season (8).
Ringbarking	The removal of the bark of a shrub or tree in a complete circle around the trunk.
Rootstock	Erect short underground stem, but term is also used for perennial, underground roots or other organs (1).
Ruderal	Weeds growing where the natural vegetational cover has been disturbed by humans. ruderal weeds of old fields and roadsides (Wiki)
Runner	An elongated stem growing horizontally above the ground and rooting at the nodes to form new plants.
Sepals	Green leaf like appendage of a flower forming outer ring of flower appendages.
Shrub	A perennial plant with usually two or more stems arising from or near the ground.
Spaced digitate	Referring to grass inflorescence – three or more racemes coming off at top or near top of grass culm.
Spikelet	Small structures of the inflorescence of a grass in which seeds are formed (6)

Glossary (cont.)

Stamen	Male part of the flower, consisting of a filament and two anthers. The anthers carry the pollen.
Stolon	An elongated stem growing horizontally above the ground and rooting at the nodes to form new plants.
Succulent	A plant with fleshy and juicy stems and leaves that contain reserves of moisture (1)
Sucker	A shoot arising from the roots of a woody plant, often some distance away from the main stem. (1)
Taproot	An unbranched, vertically descending root.
Tuber	Underground swollen part of stem or root which stores food; capable of producing new shoots from buds on its surface (8)
Tree	A large perennial woody plant with a single stem or trunk.
Umbel	An inflorescence that consists of a number of short flower stalks (called pedicels) that spread from a common point, somewhat like umbrella ribs (Wiki).
Unisexual	In unisexual plants, male and female flowers of a species are on separate plants
Whorl	Referring to an inflorescence: a ring of similar branches that spread from a common point (6).

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About the Author

Karin Spottiswoode qualified as a FGASA 1 Field Guide in 2002, has been involved in field guiding ever since, obtained her FGASA 3 qualification in 2012. She assisted in training of field guides 2006 – 2009 with Bushveld Training Adventures.

She was one of the founder members of the Friends of Kloofendal and started an Environmental Education Program in the Kloofendal Nature Reserve over weekends for family groups, people of varied interests in the natural environment in the form of two-hour guided nature walks with different topics such as birding, wildflowers, trees & shrubs, grasses, geology, insects, reptiles, frogs and a “hands-on” program for school groups during the week. Her passion has always been plants and over the years she developed a growing concern in the increase in Alien Invasive Plants in the reserve, all over Johannesburg and in the Magaliesberg. The Environmental Education program in Kloofendal has for the last eight years in part become focused on identification of AIPs, distinguishing them from the indigenous similar-looking plants, and trying out methods of controlling these invasive problem plants without using herbicides, to help the workers and students working in Kloofendal in AIP control.

The aim is now to extend this work over the city of Johannesburg where AIPs have become a huge and growing problem.

