

# Report on AIP control work done in the Kloofendal Nature Reserve

Prepared by Karin Spottiswoode for FroK, covering the period from 11<sup>th</sup> November 2020 until 24<sup>th</sup> January 2021, reporting on work done collectively by JCPZ (Johannesburg City Parks and Zoo) EPWP (Extended Public Works Programme) workers, FroK (Friends of Kloofendal) volunteers and a Scout group, all managed by FroK.

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## Background

### The Reserve

Kloofendal Nature Reserve is a critically endangered ecosystem, known as the Roodepoort Reef Mountain Bushveld, much in need of protection (van Rooyen Ecological report on Kloofendal, August 2014).

A major threat to the long-term future of the Reserve is Alien Invasive Plants that have the potential to take over large areas of the Reserve, if not the entire Reserve. South Africa has progressive laws on Alien Invasive Plants and have declared 379 species of plants that are illegally present in different areas under different conditions. All must be controlled and removed from Nature Reserves.

The impact that AIPs have on the natural environment is often not taken seriously; we have never been made aware of any AIP management plan for the Reserve. Without systematic, on-going intervention the Kloofendal Nature Reserve is under threat of being overtaken by the AIPs ( as is required by law), we could lose the reserve.

Although, according to the van Rooyen (2014) Ecological report on Kloofendal, AIPs labelled as “widespread” (Bugweed), “widespread, low” (Blackwood), to “local, moderate” (Cotoneaster, Jerusalem Cherry) to “local low” (Cestrum), all these AIP’s are doing too well and are expanding their range and size!

Colleen van Rooyen (2020) recorded and accurately mapped five Alien Invasive species in the reserve as a project in part of her second year Environmental Management degree studies end of 2020. She expressed great concern about the fact that most clumps of trees in the NE part of the reserve have blackwood trees expanding their territories amongst the indigenous plants, often as noted by me, Black Wattle, Bugweed, Lantana and Pompom weed moving in as well.

Colleen was also very concerned about the severity of Jerusalem Cherry infestation in parts of the reserve.

Important quantitative change is, that Blackwood is now observed in areas 5 and 9 where van Rooyen (2014) (not close relatives of Colleen van Rooyen) did not observe it in vegetation areas 5 and 9 in 2014 their presence has DEFINITELY INCREASED.

Our impression is that all or most AIP species have increased, except where work was done by JCPZ (mostly Black wattle, Eucalypt and Bugweed) and FroK (Eucalypt, Black Wattle and Pompom and others).

Little work has been done on other species. We are concerned that some species have become considerably more common, particularly Blackwood, Lantana, Cestrum and Jerusalem Cherry. One of the non-declared, very invasive species is *Cyanoglossum lanceolata* (Forget me not).

The AIPs consume a lot of water and mineral uptake at the expense of our native plants. The AIPs generally do not provide food for our indigenous animals, some AIPs, such as *Cestrum laevigatum* and *Datura stramonium*, are extremely toxic.

Many AIPs such as Black Wattle and Black Woods, use “Allelopathy” which is a chemical warfare where the AIPs release chemicals which inhibit growth of the neighbouring indigenous plants, allowing the AIP species becoming locally dominant.

The AIPs have many propagating methods such as root suckers, numerous seeds and intense coppicing when they get damaged. Coppiced regrowth is even more difficult to control than the stand-alone plant.

Big AIPs (Black Woods and Black Wattles, Cotoneaster and Bug Weeds) are often seen at overflowing sewerage manholes, possibly exacerbating the problem of repeated sewerage blockages and consequent spillages going into the dam. The dam is one of the main attractions of the Kloofendal Nature Reserve, we will lose it if the sewerage problem is not properly addressed.

Johannesburg City Parks (JCPZ), custodians of the reserve, have many other responsibilities, they have not been able to have a continuous AIP Management programme covering all declared species in the reserve, hence it makes sense to tackle this serious problem as a combined JCPZ / FroK project.

### Previous work on AIPs

JCPZ over the years has worked on AIPs, mostly on Black Wood, Black Wattle and Eucalyptus using different herbicide applications with some large patches being held back but with mixed success as we have seen in the field. FroK has not had access to long-term plans nor progress reports prepared by JCPZ. Recording work done with “before” and “after” pictures does not really reflect accurate recording of the value of work done, numbers of plants big and small of the different species removed, also recording location as follow up on these plants coming up again is important, as evidence does show.

For years FroK had a “once-a-month AIP control session” led by Doreen Wood, then by John Roberts and finally by Jörgen Hammerström until he passed away in November 2017.

### Data recording

The process of recording accurately what species have been worked on each day, how many have been taken out and the location is new– details are given in this report. Our modus operandi improved as we gained experience on the recording of data with early recordings being less detailed than what we require now.

Since recently data are passed on to me by WhatsApp technology, which, besides making the work done in Kloofendal more COVID-19 safe, is an efficient way of sharing information.

Management of the AIP control work, instructions can be given to all the workers on WhatsApp efficiently, queries regarding plant ID or locations where work needs to be done, can be answered by WhatsApp.

This note reports on work between Friday 11th November 2020 until Monday 25th January 2021. It will be updated and revised in successive reports.

Working teams:

- (i) JCPZ EPWP Weeding team: between 5 & 8 workers – working on AIPs under FroK’s guidance from 7h30am until 16h00 with a break from 12h00 to 13h00 for lunch.
- (ii) FroK Weeding team: 10, reduced to 8 due to Covid 19 safety precautions. Between 1 and 3 FroK team members work with the JCPZ team most mornings for two hours, check on work being done, quality control, recording species worked on, the quadrats (explanation below) in which the work was done and the progress.
- (iii) Early Morning Weeding team: between 4 and 6 – some overlap between FroK Weeding team and Early morning team, working in early morning in different areas of the reserve on specific AIP species, not in conjunction with JCPZ team.
- (iv) Scouts Weeding Team: between 2 and 5 scouts managed by FroK, working in different location to JCPZ team on various AIP species. They had four five hour weeding sessions

Presently scouts have not been allowed to continue with their work due to Covid 19 safety regulations prescribed by their Scouting management.

Each team has been recording work done on the AIP's (Alien Invasive Plants) in a book provided for that purpose.

Colleen van Rooyen, second year Environmental Management student at UNISA and no relative of Noel and Gretha van Rooyen, as part of her project, mapped 5 species of AIPs in Kloofendal into labelled 100 metre by 100 metre squares (Quadrats).

This project showed how utterly serious the AIP problem in Kloofendal is, and she only mapped 5 species! There are 59 declared AIP species in Kloofendal listed in Appendix 6.

The JCPZ and FroK teams worked on 20 species of problematic invasive plants in Kloofendal (see Report on AIP control work done in the Kloofendal Nature Reserve, listed in [Appendix 1](#)) The list increases as we cover more areas of the reserve.

The Scouts worked on 5 species.

The period of work on AIPs does not include the holiday season, the few days when the JCPZ Weeding team was taken to work in locations outside the reserve and workers not working due to rainy weather conditions.

Jonathan Leeming, well known conservationist and snake and scorpion expert, gave a short presentation on snakes to all the Kloofendal EPWP workers, FroK volunteers and some of the security guards on Monday 23rd November 2020. In the previous week we had three snake encounters, so I felt the need to try to reduce the workers' fear of snakes, encouraging them to allow snakes to move away and not try and kill them.

Counting and recording of AIP's removed has much improved as experience and methodology improved.

Total species of AIPs worked on during this project is 22 – see [Appendix 1](#)

There are many more serious AIPs in Kloofendal, this is a start of a huge AIP project so very much needed to conserve Kloofendal for future generations, where JCPZ and FroK together can make a difference.

I hope to be able to finish my illustrated booklet on identification of AIP's in Kloofendal this year, which I have been inspired to write over the last few years, to assist in AIP control in Kloofendal and other reserves and nature areas in Johannesburg.

## Acknowledgements

Phillip Mkhombo (JCPZ) for allowing FroK to work with some of his JCPZ team for 4 months – still one month left.

FroK Volunteers

Amber Williams and her scout volunteers.

## References

ALIEN AND INVASIVE SPECIES LISTS, 2020, Government Gazette. Accessed on 27<sup>th</sup> January 2021 at [https://www.gov.za/sites/default/files/gcis\\_document/202009/43726gon1003.pdf](https://www.gov.za/sites/default/files/gcis_document/202009/43726gon1003.pdf)

van Rooyen, N. and van Rooyen,G (2014) KLOOFENDAL NATURE RESERVE, part 1, ECOLOGICAL EVALUATION

van Rooyen, N. and van Rooyen,G (2014) KLOOFENDAL NATURE RESERVE, part 2, ECOLOGICAL MANAGEMENT PLAN

van Rooyen, C. (2020) Unpublished report, UNISA.

Karin Spottiswoode

BSc (OT) (Wits), Dip Special Education (UNISA), FGASA level 3

FroK team manager of this present AIP project in Kloofendal

## Appendix 1. Alien Invasive plants worked on

Alien Invasive Plants (AIPs) worked on 11<sup>th</sup> November 2020 until 25<sup>th</sup> January 2021. The most recent list of declared AIPs can be found at Creecy (2020). Species accessed through Alien Invasive Plants List For South Africa. Latest revised edition 2019 – With Photographs for Easier Identification

<http://www.environment.co.za/weeds-invaders-alien-vegetation/alien-invasive-plants-list-for-south-africa.html>

List numbers from <https://archive.opengazettes.org.za/archive/ZA/2020/government-gazette-ZA-vol-663-no-43726-dated-2020-09-18.pdf>

Listed AIP are declared invaders in South Africa and should be removed by law according to the category they are in.

The species we are working on all fall in category 1b, except for two non-listed species.

Category 1b: Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited (National Listed Invasive Species – NEMBA AIS Regulations)

List Number	Species	Category	Numbers of plants removed
119	Yellow bells (BELLS) <i>Tecoma stans</i>	1b	119
339	Bug Weed (BUG) <i>Solanum mauritianum</i>	1b	377
11	Black Wood (BW) <i>Acacia melanoxylon</i>	2	267
99	Cotoneaster (CE) <i>Cotoneaster franchetii</i>	1b	172
88	Cestrum (CL) <i>Cestrum laevigatum</i>	1b	23
21	Crofton Weed (CROFT) <i>Ageratina adenophora</i>	1b	94
118	<i>Datura Stramonium</i> / Malpitte (DAT)	1b	86
107	Dodder (DOD) <i>Cuscuta campestris</i>	1b	To work on
ND	Forget me nots (FMN) <i>Cyanoglossum lanceolata</i>		9016
271	Inkberry (INK) Forest Inkberry - <i>Phytolacca octandra</i>	1b	Flower heads slashed
340	Jerusalem Cherries (JC) <i>Solanum pseudocapsicum</i>	1b	2472
186	Lantana (LA) <i>Lantana camara</i>	1b	448
43	Mexican Poppy (MEX) <i>Argemone mexicana</i>	1b	94
39	Moth catcher (MOTH) <i>Araujia serricifera</i>	1b	114 + 5131 seedlings
71	Pompom weed (POM) <i>Campuloclinium macrocephalum</i>	1b	540
342	Prickly solanum (PRS) <i>Solanum sisymbriifolium</i>	1b	1
190	Privet (PV) <i>Ligustrum japonicum</i> (big shiny leaves)	3	4
192	Privet (PV) <i>Ligustrum ovalifolium</i> (small leaves)	3	
297	Pyracantha (PYR) <i>Pyracantha angustifolia</i>	1b	1

322	Sambucus (SAM) <i>Sambucus canadensis</i>	1b	Not recorded
94	Scotch thistle (SCOTCH) <i>Cirsium vulgare</i>	1b	3
211	Syringa (SYR) <i>Melia azadarach</i>	1b	12
371	Verbena (VERB) <i>Verbena bonariensis</i>	1b	14
372	Verbena (VERB) <i>Verbena brasiliensis</i>	1b	
10	Wattle Tree (WT=Wattle Tree) Black Wattle <i>Acacia Mearnsii</i>	2	684
	4	Wattle Tree (WT) <i>Acacia dealbata</i>	
ND	Zimbabwe Creeper (ZW) <i>Podranea rircasoliana</i>		

ND = not declared.

Some of the non-declared alien invasive plant species, such as the Forget-me-nots (*Cyanoglossum lanceolata*), are very successful in Kloofendal, taking over grassland, so need to be removed.

The Forest Cestrum, *Phytolacca octandra*, which is declared, category 1b, we have been advised to leave, as it is a pioneer, and the native plants will ultimately take over, but we have been slashing the flower heads to prevent seeding.

Our recording methodology has improved, initially counting and recording was not good, also at times extra workers joined us and they did not count their individual plants removed, hence many plants, such as Scotch thistle and Prickly Solanum were not counted

The bigger plants, trees and shrubs, are much harder to remove than smaller ones, they take more time, often it is a team effort

Many invasive plants grow amongst our native plants and are not easily accessible. Obstructive branches have to be cut away before the actual removal of the plant can take place, removing plants from rocky areas is more difficult and hard work.

We have been working on 22 species as AIP's like growing together in disturbed ground, places where there has been human interference, such as near fences, any building structures such as below power pylons, places where water and sewerage pipes have been laid, along paths, any gardening work where soils get turned, the AIPs like growing under stashed wood piles.

The workers are learning to recognize the various species well, there are more AIPs to be learnt as we work in different areas of the reserve.

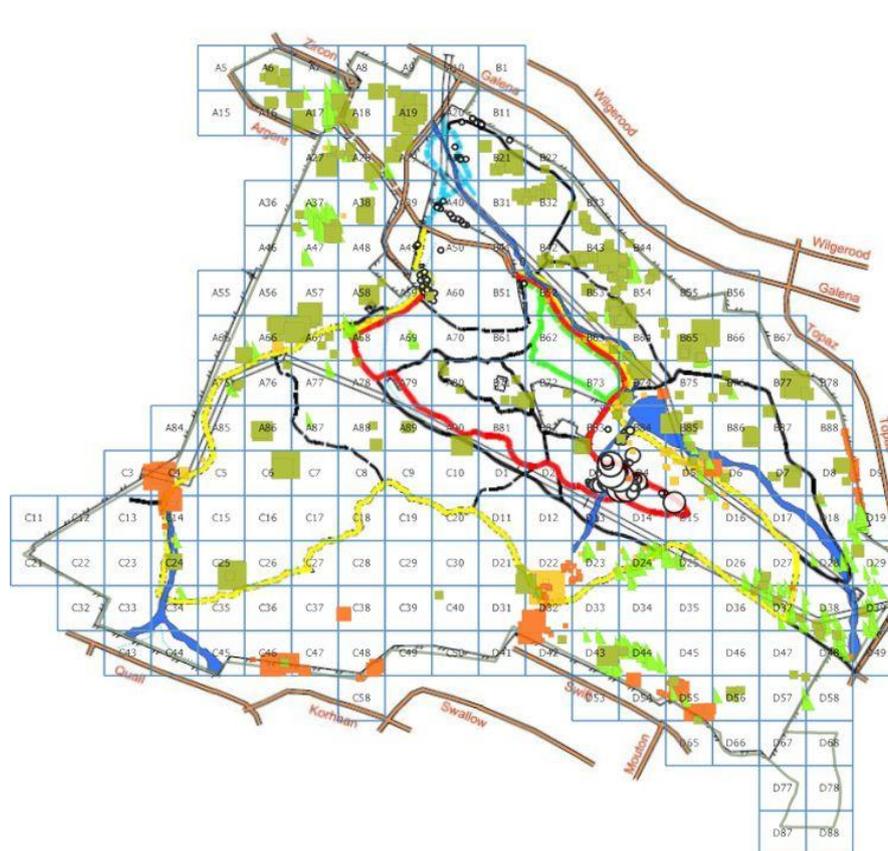
## Appendix 2. Map

Map of Kloofendal created by Steve Spottiswoode

Map with quadrats created by Colleen van Rooyen

The two maps overlaid together into one map created by Lauren Kruger

This map enables a manager, me in this case, in consultation with the teams, to draw up a management plan of work to be done on the different species, during the different seasons, in the different areas of the reserve and capacitates the workers to accurately record where they are working, record work they have done in the different areas of the reserve every day, it allows for planning the necessary follow ups (monthly or yearly) in all the areas where they have worked.



Paths include the yellow (long), red (medium length), blue and green trails (both short). Other unmarked paths are in black. Roads are brown. Waterways are blue. Fencing around the reserve is hatched black. The quadrats (100 by 100 metre squares) are labelled with a letter and number.

Colour code of the five AIPs in Colleen's project:

Dark green = Black Wood (BW)

Light green = Black Wattle (WT=Wattle Tree)

Dark orange = Cestrum laevigatum (CL)

Circles = Jerusalem Cherry (JC)

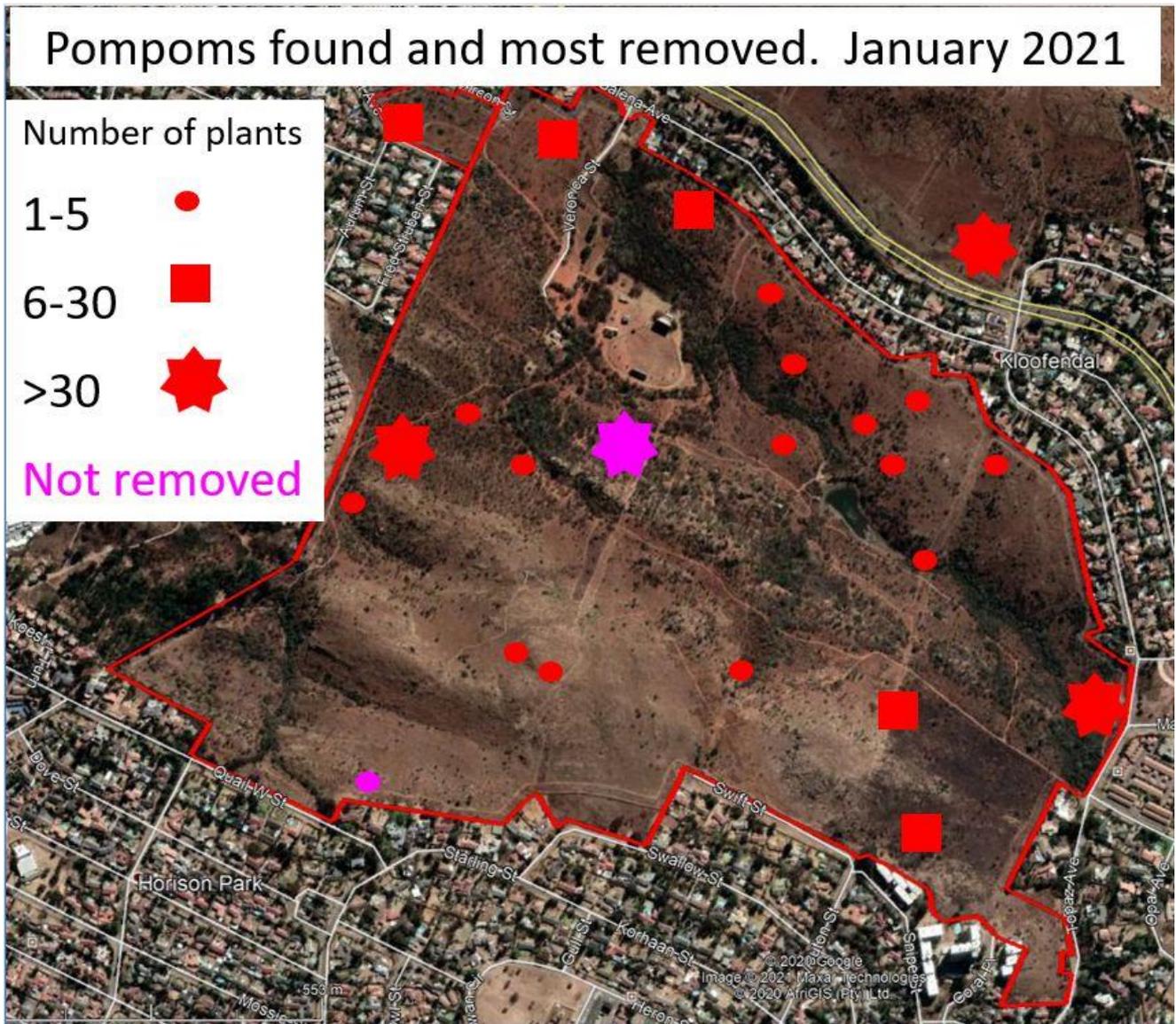
Light yellow squares = Cotoneaster (CE)



Map of Kloofendal with the quadrats, areas worked on so far, highlighted in yellow

Follow up is essential.

QFields is an application available on the cell phone, where GPS is actively recording where you are in the reserve and it has the quadrats on it, but no paths, fences or power lines are shown on that map. QFields is used to ensure accurate location of where the work was done.



Map Pompom weed (*Campuloclinium macrocephalum*) control in Kloofendal  
Map compiled by Steve Spottiswoode, who has been driving this project

The Pompom weed is extremely invasive, a threat in overtaking grassland, as can be seen all over Gauteng. JCPZ, FroK and scouts have been actively working on removal of this weed in Kloofendal for various years with success, but ongoing follow up and removal is essential to stop it from spreading again.

### Appendix 3. Methodology of removing Alien invasive plants in Kloofendal

- (i) Pulling and digging out, with minimal disturbance of the soil (disturbance of the soil creates seeds from the AIPs in the vicinity to grow again and more prolifically) using weeding tool or big fork if necessary.

	
<p>Digging out roots with minimal disturbance of the soil. Root stock and plant are left to decompose amongst the grass</p>	<p>If the plant is flowering and seeding, flower heads are removed before digging out the plant. The plant should be removed before flowering and seeding where possible. Flowers and seeds to be put in bags, removed from site, the bag sealed and left to rot at the skip.</p>

AIP Control of Pompom weed (*Campuloclinium macrocephalum*)

Sound AIP plant removal methodology makes possibility of regrowth less, but yearly follow up is still essential.

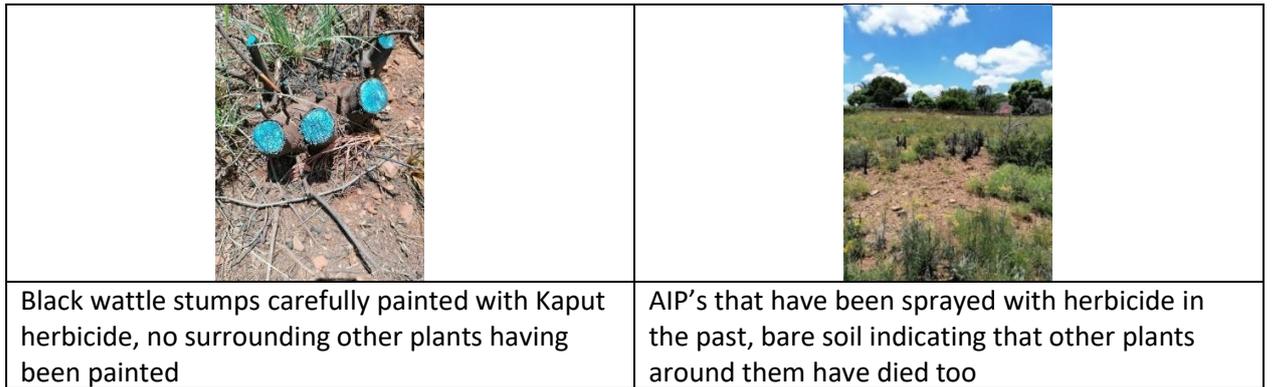
- (ii) Tree Popper – three sizes, small, medium and big, to use on young trees – the tree popper works well at pulling plants, roots and all, out of the ground. Additional tools needed are loppers, saw, big weeding fork and good leather gloves to protect the workers from thorny plants such as Lantana camara and Scotch thistle.

			
<p>Working on big Jerusalem Cherries with a tree popper</p>	<p>Black Woods having been removed with the tree poppers – see all the root stocks</p>	<p>Environmental monitors learning how to use a tree popper, here working on a big Lantana</p>	<p>Working on Yellow Bells (<i>Tecoma stans</i>), first using saw and loppers to cut all the branches away, and then with tree popper and spade taking the whole plant (actually lots of plants together) roots and all, out</p>

- (iii) Girdling – for bigger trees – ringbark stem between ½ and 1 meter above the ground, and strip off the bark all the way round the tree. Trees are left standing so that the effectiveness from girdling can be observed. However, shrubs such as Yellow Bells (*Tecoma stans*) are very dense, and branches need to be cut and sawn off in order to reach the core of the shrub. Only then can all the cut branches be ring barked and the bark stripped down to the roots. Tools needed for girdling are pangas. Saw and loppers are needed in order to get access to stem of the trees.



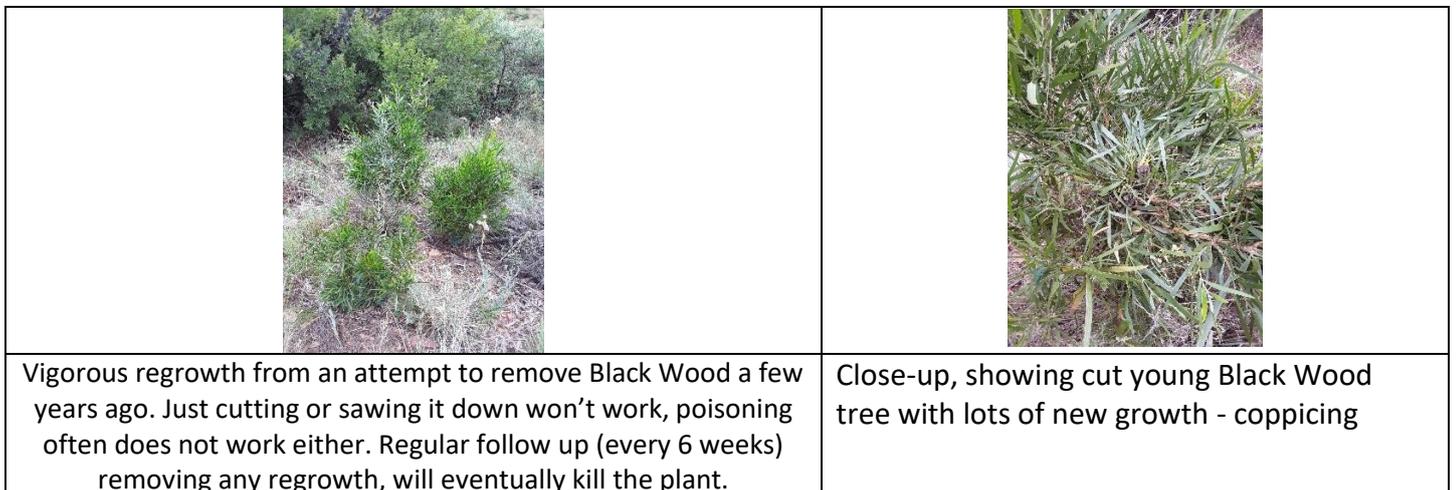
- (iv) Use of herbicide – initially Kaput was used for big Black Wattle trees, they were cut low above the ground and poisoned within 8 minutes as prescribed on the Kaput instructions.



We prefer not to use herbicide, particularly in a nature reserve. Herbicides can and do affect indigenous plants around them.

Work done on AIPs in the Roodekrans Ridge has shown remarkable success without use of herbicides.

Regular follow up is essential in AIP control.



## Appendix 4. Record keeping of number of alien invasive plants removed during days worked and the location (quadrats)

On day 1 of this project, two WhatsApp groups were compiled, one for the JCPZ Weeding team (8 workers) and one for the FroK Weeding team (the Friends of Kloofendal volunteers, initially 10) for work communications.

Each team was issued with a book for record keeping.

The FroKWeeding team drew up a roster of who was going to work with the JCPZ team on the different weekdays – two or at times 3, volunteers per morning, to work with the JCPZ team for two hours.

The JCPZ team was to keep record of AIP species and number of each species removed each day.

I took both teams for an introductory walk through the reserve to introduce them to the various AIP's which we would be working on, and to show the teams the serious need for AIP control in Kloofendal, the impact the AIP's are having and will increasingly so continue to have, on Kloofendal if not controlled. Control does include the necessary follow up!

I initially spent every morning with the teams to systematically teach them which the problem AIP's in Kloofendal are, how to recognize them and not confuse them with indigenous, non-invasive plants. We would work on them together, learn how to remove them, ensure non-propagation by bagging (put into black bags and remove) fruits and seeds where possible.

Using the Weeding map, I set up a weeding management plan, worked out each week where the teams needed to work, taking into consideration flowering and seeding times of AIP's, removing AIP's before they flower and cast seeds. Also some AIP's are difficult to identify when not flowering or fruiting, such as Lantana, Jerusalem Cherry, *Cestrum*, Cotoneaster, so one needs to work on those while they are flowering.

I created awareness of some AIPs being very poisonous such as *Cestrum laevigatum*, some AIPs possibly causing allergic reactions such as Moth Catcher latex (sap), *Cestrum laevigatum* when cutting it gives off a smell that can cause asthmatic coughing (I have that reaction), the sap can cause itching and is very poisonous, Bugweed has fine hair on its leaves that can cause a rash and itching, so wearing of leather gloves, protective clothing and masks are recommended as a precaution. Also handwashing before eating. Berries of Jerusalem Cherries are poisonous, again handwashing required after working with Jerusalem Cherries.

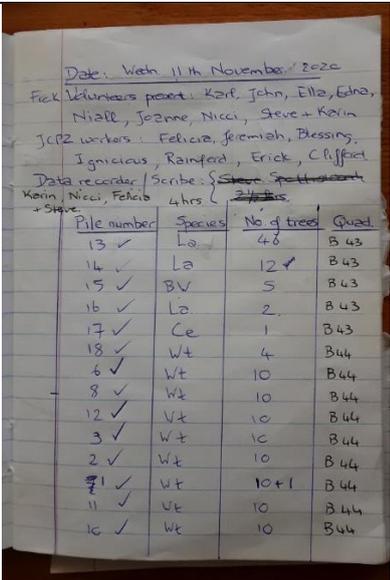
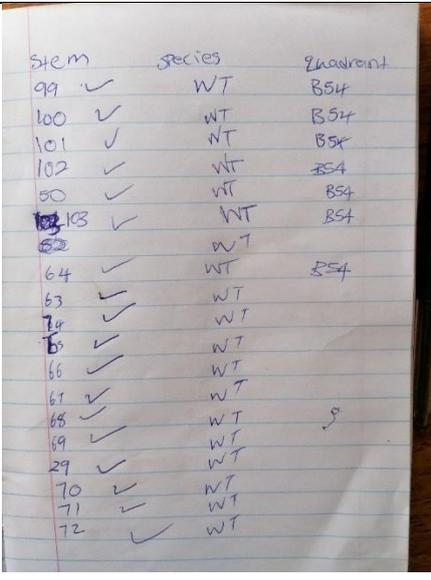
At present the herbicide Kaput is only to be used only on Lantana too big to come out with a tree popper, and *Cestrum laevigatum*

Kaput is a gel applied with a paintbrush to the freshly cut AIP stem, this is to prevent poisoning other indigenous plants in the vicinity which is easily possible when using a herbicide spray. Equipment needed for herbicide application are protective gloves, the Kaput gel and application brush.

As part of the record keeping, I asked for the plants removed to be put in piles marked with red and white hazard tape, recording on it the date, the species, a pile number and number of plants in each pile.

		
<p>Black Wattle – putting into piles for recording numbers of trees popped out with tree popper</p>	<p>Labelling Jerusalem Cherries into <b>small</b> piles of ten root stocks - these big Jerusalem Cherries were pulled out with the tree poppers</p>	<p>Alternatively, labelling <b>big</b> piles of Jerusalem Cherries, this pile has 129 root stocks</p>

This would be recorded in the JCPZ Weeding team recording book with the quadrat (location) where the work was done, ideally at the end of each day, which initially did not happen, but is happening now.

	
<p>Recording in piles of plants/ trees Nov. 2020</p>	<p>Recording stumps/ stem Nov. 2020</p>

Wt = Wattle tree = Black Wattle

Ce = *Cestrum* (should be *Cotoneaster*, but CE was used initially for *Cestrum*. *Cestrum* should be marked Cl = *Cestrum laevigatum*)

La = *Lantana camara*

Quad = quadrat, which is the 100 by 100 metre square in Kloofendal where the plants were removed

The recording above on the left, is from young trees having been removed with the aid of the tree poppers.

The counting, in the case of cut trees (too big for the tree poppers) and the stumps being poisoned, would be numbering and counting of the stumps, and not counting the cut down trees and branches – see above right side.

DATE	SPECIES	PILE NO.	QUADRANT	No.
19/1/2021	CL	KD1	D3	10
19/1/2021	JC	KD2	D3	105
19/1/2021	CL	KD3	D3	11
19/1/2021	JC	KD3	D3	129
19/1/2021	JC	KD4	D3	139
19/1/2021	JC	KD5	D3	37
19/1/2021	JC	KD6	D6	61

Recording done on previous work on big Lantanas work which had not been recorded yet.

Right hand column is recording of number of plants (shrubs in this case) removed in each pile

Species:

CL = *Cestrum laevigatum*

JC = *Jerusalem Cherries*

### Appendix 5. Record of hours worked in the field by FroK Volunteers on the AIP Project so far

Name	Hours
Brenda	2
Edna	22
Ella	13
Helene	56
Joanne	33
John	13
Karin	77
Karl	24
Niall	43
Nicci	43
Peter	3
Steve	49
Total	378

## Appendix 6. List of declared AIPs in Kloofendal

List Number	Species	Category
2	<i>Acacia baileyana</i>	3
4	<i>Acacia dealbata</i>	2 – in a riparian areas are category 1b
6	<i>Acacia elata</i>	1b
10	<i>Acacia mearnsii</i>	2 – in riparian area 1b
11	<i>Acacia melanoxylon</i>	2 - in riparian area 1b
19	<i>Agave americana</i>	
20	<i>Agave sisalana</i>	2 - in riparian area 1b
21	<i>Ageratina adenophora</i>	1b
29	<i>Ailanthus altissima</i>	1b
39	<i>Araujia sericifera</i>	1b
43	<i>Argemone ochroleuca</i>	1b
58	<i>Bryophyllum delagoense</i>	1b
69	<i>Callistemon viminalis</i>	3 - in riparian area 1b
71	<i>Campuloclinium macrocephalum</i>	1b
72	<i>Canna indica</i>	1b
79	<i>Celtis australis</i>	3 - in riparian area 1b
80	<i>Celtis occidentalis</i>	3 - in riparian area 1b
85	<i>Cereus jamacaru</i>	1b
86	<i>Cestrum aurantiacum</i>	1b
88	<i>Cestrum laevigatum</i>	1b
94	<i>Cirsium vulgare</i>	1b
98	<i>Cortaderia selloana</i>	1b
99	<i>Cotoneaster franchetii</i>	1b
101	<i>Cotoneaster pannosus</i>	1b
104	<i>Crolaria agatiflora</i>	1b
107	<i>Cuscuta campestris</i>	1b
118	<i>Datura stramonium</i>	1b
121	<i>Duchesnea indica</i>	1b
134	<i>Eucalyptus camaldulensis</i>	1b
179	<i>Ipomoea purpurea</i>	3 - in riparian area 1b
181	<i>Jacaranda mimosifolia</i>	1b
186	<i>Lantana camara</i>	1b
190	<i>Ligustrum japonicum</i>	3 - in riparian area 1b
192	<i>Ligustrum ovalifolium</i>	3 - in riparian area 1b
211	<i>Melia azedarach</i>	1b
214	<i>Mirabilis jalapa</i>	1b
216	<i>Morus alba</i>	1b
247	<i>Opuntia spinulifera</i>	1b
248	<i>Opuntia stricta</i>	1b
265	<i>Pennisetum setaceum</i>	1b
268	<i>Persicaria capitata</i>	1b
271	<i>Phytolacca octandra</i>	1b
278	<i>Pinus roxburghii</i>	2 - in riparian area 1b

291	<i>Prunus serotina</i>	1b
297	<i>Pyracantha angustifolia</i>	1b
305	<i>Robinia pseudoacacia</i>	1b
319	<i>Salvia tiliifolia</i>	1b
322	<i>Sambucus canadensis</i>	1b
335	<i>Sesbania punicea</i>	1b
338	<i>Solanum elaeagnifolium</i>	1b
339	<i>Solanum mauritianum</i>	1b
340	<i>Solanum pseudocapsicum</i>	1b
342	<i>Solanum sisymbriifolium</i>	1b
358	<i>Tecoma stans</i>	1b
361	<i>Tipuana tipu</i>	3 - in riparian area 1b
366	<i>Tradescantia fluminensis</i>	1b
371	<i>Verbena bonariensis</i>	1b
372	<i>Verbena brasiliensis</i>	1b
374	<i>Vinca major</i>	1b
Total 59 nationally listed AIPs in Kloofendal, according to the NEMBA Regulations Act		

NEMBA AIS Regulations – category 1b = Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited.

## Appendix 7 List of non-declared problematic alien invasive plants in Kloofendal Not complete

Latin name	Common name	Comments
<i>Cyanoglossum lanceolata</i>	Forget me not	Very invasive all over reserve in disturbed areas.
<i>Cyathula cylindrica</i>	Burr weed	Mainly in Dassie rock area
<i>Cyathula uncinulata</i>	Burr weed - rondekliets	In shady areas – burrs stick on animal's fur, so it spreads easily
<i>Dicerocaryum eriocarpum</i>	Devil's thorn	Invasive ground cover with seed with two sharp (Devil's) thorns on it, painful to step on, found in amphitheatre area
<i>Eucalyptus cinerea</i>	Florist gum	West part of reserve
<i>Jasminium polyanthum</i>	Jasmin	Intruding from Galena street side of reserve
<i>Jasminium mesnyi</i>	Primrose jasmin	Intruding from Galena street side of reserve
<i>Plantago lanceolata</i>	Plantago	Replacing grass in Kloofendal amphitheatre lawn, but not as aggressively as the Richardia
<i>Podranea rircasoliana</i>	Zimbabwe creeper	Intruding into Kloofendal from neighbouring property along Galena fence – locally dense invader
<i>Richardia brasiliensis</i>	Richardia	Replacing grass in Kloofendal amphitheatre lawn, spreading into reserve long paths
<i>Zinnia peruviana</i>	Zinnia	Spreading in various sunny areas.

Weeds like Black Jacks, Khakibos/ weed, Cape Gooseberry should be slashed before seeding.

Indigenous invaders such as *Leucosidea sericea* and *Lopholaena coriifolia* are invading, but certainly not as bad as our aggressive, persistent AIPs, which need urgent attention.