

# 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 31<sup>st</sup> March 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 two Scout groups, all managed by FroK.

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## Background

The [Friends of Kloofendal](#) was founded in August 2003, with the vision of preserving natural fauna and flora in the Kloofendal Nature Reserve, managed according to sound ecological principles.

The Kloofendal Nature Reserve is a critically endangered ecosystem, known as the Roodepoort Reef Mountain Bushveld and is much in need of protection (van Rooyen Ecological (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 has declared 379 species of plants that are illegally present in different areas under different conditions. All must be controlled and removed from Nature Reserves.

Alien Invasive Plants displace indigenous plants <https://www.daff.gov.za/docs/Infopaks/Alien.html>.

Large areas of our country have been infested with invading alien plants. They destroy precious vegetation such as fynbos in the Western Cape. In Kloofendal Blackwoods, Lantana and Bugweed are competing with our indigenous *Protea roupelliae*, a special Protea in Kloofendal

Some AIPs, such as *Cestrum laevigatum* and *Datura stramonium*, are extremely toxic, could be harmful to the browsers in the reserve.

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

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), are doing too well and are expanding their range, size and numbers!

Colleen van Rooyen (2020) recorded and mapped onto a QGIS (2020) database five AIP species in the reserve as a project in part of her second year Environmental Management degree studies at the end of 2020. These were also attributed to over 150 one-hectare quadrats for planning and field recording of work done.

Ms van Rooyen 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. Ms van Rooyen was also very concerned about the severity of Jerusalem Cherry infestation in parts of the reserve.

An 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 2014 showing that their presence has DEFINITELY INCREASED.

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

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 nots).

Why do invading alien plants grow so well?

In South Africa these plants have no natural enemies such as insects, animals and diseases that would have controlled them in their own countries. <https://www.daff.gov.za/docs/Infopaks/Alien.html>

They use a lot of water.

Invading alien plants use much more water than indigenous trees and plants. They prevent rainwater from reaching rivers and deprive people and ecosystems of much needed water. Many springs and streams have already dried up because of invading alien trees.

By clearing invading alien vegetation, we improve water supplies.

The AIPs have many propagating methods such as root suckers, numerous seeds and intense coppicing when they get damaged. Coppiced regrowth can become even more difficult to control than the stand-alone plant if not controlled.

Big AIP plants, such as Black Woods, Black Wattles, Cotoneaster and Bugweed in Kloofendal, are often seen at sewerage manholes that have overflowed, 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 and we will lose its attraction 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 has worked on AIPs over the years, 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 readily 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, after which FroK only did ad-hoc work.

#### Role players in this new JCPZ/FroK AIP Control Programme

**JCPZ** – providing EPWP workers from 11<sup>th</sup> November 2020 until 31<sup>st</sup> March 2021 under their contract management, to work with FroK on Alien Invasive Plant control in the Kloofendal Nature Reserve.

**Phillip Mkhombo**, JCPZ manager of Kloofendal, supporting this new AIP Control management in Kloofendal.

**Karin Spottiswoode** from Friends of Kloofendal, manager of this AIP control project

**EPWP workers** – a team of approximately 8 workers was allocated to FroK to manage in AIP control, 11<sup>th</sup> November 2020 until 31<sup>st</sup> March 2021

**FroK Weeding team** – FroK volunteers who helped guide the JCPZ Weeding team where to work and on which plants, check attendance, check on work done and work with the JCPZ Weeding team for about two hours, initially each morning.

**Amber Williams** – 40 hours community service for Scout Springbok project – she had 3 to 5 fellow scouts help her in this project, on eight 5-hour mornings, supervised by Karl Wearne from FroK.

**Helderkruin Voortrekkers** (25 children & 5 adults under supervision of Karin Spottiswoode) worked Saturday morning, 27<sup>th</sup> March, on AIP control of young Jerusalem Cherries, one particular AIP species.

**Steve Spottiswoode** – assisted in documenting work done by workers on each species in the different locations (quadrats).

**Colleen van Rooyen** – devised a map of Kloofendal in which the reserve is divided into quadrats (100 by 100 m<sup>2</sup>) which allows for mapping of AIPs in the different parts of the reserve. She mapped five AIP species.

**Lauren Kruger** – who superimposed the FroK Kloofendal map onto Colleen's quadrat map, to assist EPWP workers to record the locality of their work done in the field.

## Data recording

The process of recording what species have been worked on each day, how many have been taken out and the location determined using QFIELD (2021) and expressed as the quadrat mentioned above. This process was developed by FroK and van Rooyen (2020). Our modus operandi improved as we gained experience in the recording of the data.

Since the beginning of January 2021, data have been passed on to me by WhatsApp messaging which, besides making the work done in Kloofendal more COVID-19 safe, is an efficient way of generating and sharing text and pictures, made possible by the fact that most role-players now have smartphones.

WhatsApp on the smart phones allowed for management of the AIP control work, instructions as to which plants to work on, in the different quadrats, workers could send queries regarding plant ID or locations where work needed to be done.

Of course, FroK's physical presence was required for management of the work on the ground and checking if the work was done properly.

Working teams:

- (i) JCPZ EPWP Weeding team: between 5 & 8 workers –from 7h30am until 16h00 with a break from 12h00 to 13h00 for lunch, working on AIPs under FroK's guidance
- (ii) FroK Weeding team: 10, reduced to 8 due to Covid 19 safety precautions. Between 1 and 3 FroK team members initially worked with the JCPZ team most mornings for two hours, checked on work being done, did 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 eight five hour weeding sessions.
- (v) Helderkruin Voortrekkers worked on Jerusalem Cherries on Saturday 27<sup>th</sup> March 2021 Each team initially recorded work done on the AIPs in a book provided for that purpose. Since January 2021 records (statistics and pictures of work done) were sent to the FroK phone via WhatsApp. This data would then be put onto a spreadsheet, the different invasive species removed in the different quadrats, calculated and recorded as listed in the appendices below – big thank you to Steve Spottiswoode for his work in this area!

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Colleen van Rooyen, second year Environmental Management student at UNISA 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, she only mapped 5 species, whereas there are 59 declared AIP species in Kloofendal as listed in Appendix 6.

The JCPZ and FroK teams worked on 29 species of problematic invasive plants in Kloofendal (see Report on AIP control work done in the Kloofendal Nature Reserve, listed in [Appendix 1.](#))

The Scouts worked on 5 species and the Voortrekkers only on one 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. In addition, they lost 10 working days in March due to poor administration of their wages.

Jonathan Leeming, a 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 AIPs removed has much improved as experience and methodology improved.

Total species of AIPs worked on during this project is 28 – see [Appendix 1](#)

There are many more serious species of AIPs in Kloofendal. This is a start of a big 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 AIPs 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

FroK Volunteers

Amber Williams and her scout volunteers.

Jan Bezuidenhoudt, leader of the Helderkruijn Voortrekkers and the Helderkruijn Voortrekkers

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Karin Spottiswoode

FroK team manager of this present AIP project in Kloofendal

FGASA (Field Guide Association of South Africa) level 3, organiser of environmental education programmes, as part of FroK for people of all ages, for schools, family groups and interested individuals, for 18 years in Kloofendal Nature Reserve.

BSc (Occupational Therapy) Wits; Diploma in Special Education for Therapists (UNISA)

In the process of writing a booklet on ID of AIPs in Kloofendal

## Appendix 1. Alien Invasive plants worked on

Alien Invasive Plants (AIPs) worked on 11<sup>th</sup> November 2020 until 31<sup>st</sup> March 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 species are declared invaders in South Africa and should be removed by law according to the category they are in.

All the declared species listed below must be controlled by law. In riparian areas category 2 and 3 AIPs become category 1b.

Category 1b: Invasive species 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 up to 31 <sup>st</sup> March
119	Yellow bells (BELLS) <i>Tecoma stans</i>	1b	119
339	Bug Weed (BUG) <i>Solanum mauritianum</i>	1b	1343
11	Black Wood (BW) <i>Acacia melanoxylon</i>	2	1489
99	Cotoneaster (CE) <i>Cotoneaster franchetii</i>	1b	
101	Cotoneaster (CE) <i>Cotoneaster pannosus</i>	1b	563
88	Cestrum (CL) <i>Cestrum laevigatum</i>	1b	1943
21	Crofton Weed (CROFT) <i>Ageratina adenophora</i>	1b	650
118	<i>Datura Stramonium/ Malpitte (DAT)</i>	1b	134
107	Dodder (DOD) <i>Cuscuta campestris</i>	1b	6
ND	Forget me nots (FMN) <i>Cyanoglossum lanceolata</i>		12386
214	Four-o'clock (4oc) <i>Mirabilis jalapa</i>	1b	566
271	Inkberry (INK) Forest Inkberry - <i>Phytolacco octandra</i>	1b	Flowers & fruit removed
181	Jacaranda (JAC) <i>Jacaranda mimosifolia</i>	1b	9
340	Jerusalem Cherries (JC) <i>Solanum pseudocapsicum</i> - big plants and medium sized plants	1b	2557
340	Jerusalem Cherries - small plants i	1b	1399
186	Lantana (LA) <i>Lantana camara</i>	1b	1173
43	Mexican Poppy (MEX) <i>Argemone mexicana</i>	1b	94
39	Moth catcher (MOTH) <i>Araujia serricifera</i>	1b	263
39	Moth catcher (MOTH) <i>Araujia serricifera</i> -seedlings		5131
71	Pompom weed (POM) <i>Campuloclinium macrocephalum</i>	1b	850
342	Prickly solanum (PRS) <i>Solanum sisymbriifolium</i>	1b	25
190	Privet (PV) <i>Ligustrum japonicum</i> (big shiny leaves)	3	28
297	Pyracantha (PYR) <i>Pyracantha angustifolia</i>	1b	4
94	Scotch thistle (SCOTCH) <i>Cirsium vulgare</i>	1b	3
211	Syringa (SYR) <i>Melia azadarach</i>	1b	53

371	Verbena (VERB) <i>Verbena bonariensis</i>	1b	58
372	Verbena (VERB) <i>Verbena brasiliensis</i>	1b	
10	Black Wattle (WT) <i>Acacia Mearnsii</i>	2	
4	Wattle Tree (WT) <i>Acacia dealbata</i>	2	1134
ND	Zimbabwe Creeper (ZW) <i>Podranea ricasoliana</i>		44

ND = not declared.

Notes:

- (1) The non-declared invader *Cynoglossum lanceolata* (Forget-me-not) were removed as they are very invasive in Kloofendal, growing amongst the other invaders, with their numerous sticky seeds making work there very difficult. This species is uncommon in other comparable nature areas.
- (2) *Podranea ricasoliana* (Zimbabwe Creeper) is a non-declared species that has successfully invaded a very disturbed area and is being successfully controlled.

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.

The prolific category 1b *Salvia tiliifolia* has only appeared in Kloofendal over the last ten years or so. We have asked JCPZ to brush cut and remove the cut branches, to reduce seed production, yet still provide a protective ground cover. Pulling out the plants would cause lots of disturbance, loose soil, and would be ideal for their seeds to sprout and propagate.

Our recording methodology has improved. Initially counting and recording was not good, also at times additional workers joined us and they did not count their individual plants removed, hence many plants, such as Scotch thistle and Prickly Solanum (*Solanum sisymbriifolium*) were not counted or undercounted.

The bigger plants, trees and shrubs, are much harder to remove than smaller ones, they take more time and effort, 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 28 species. AIPs 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. AIPs grow in valleys where their seeds have been washed down and where the soils are better.

Some species of the same genus, with the same category status, have been counted together, such as *Acacia mearnsii* and *A. dealbata*, *Verbena brasiliensis* and *V. bonariensis*, and *Cotoneaster franchetii* and *C. pannosus*.

The workers have learnt to recognize the various species.

As FroK members at times, did not give me records of how many AIPs they pulled out, more Pompoms, Bugweed, Jerusalem Cherries, Forget me nots were pulled out than recorded above, also the many

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Jerusalem Cherry berries and Forget me not seeds removed and put in bags, could not be counted as  
number of plants removed.

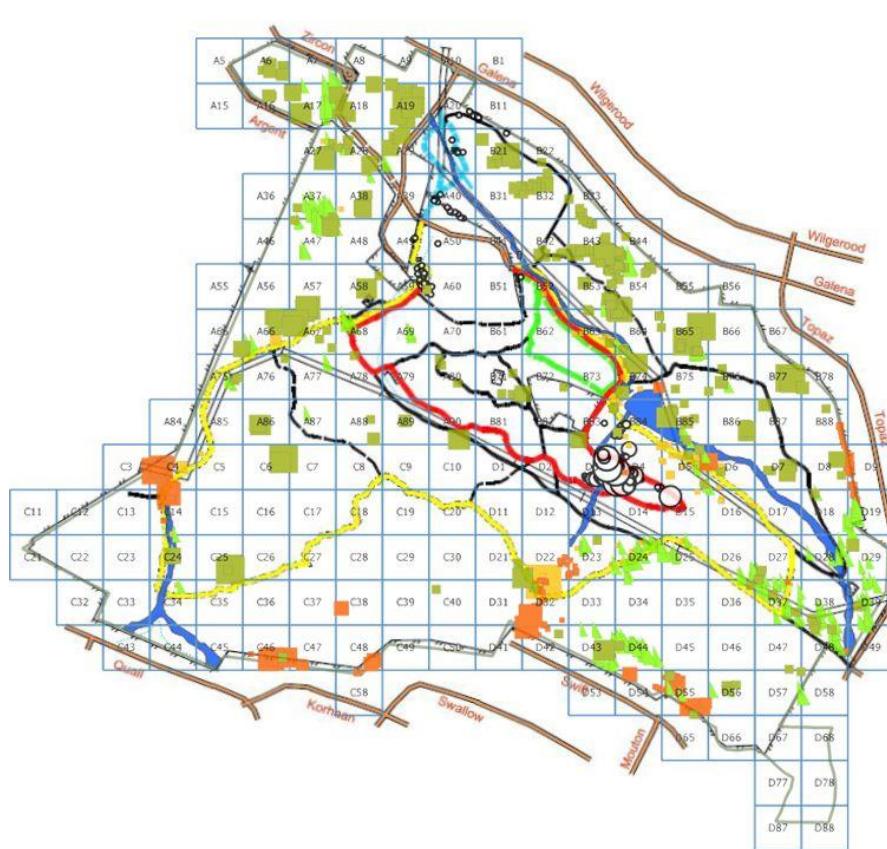
## Appendix 2. Map

Map of Kloofendal created by Steve Spottiswoode

Map with quadrats created by Colleen van Rooyen and extracted from her database on QGIS (2021).

The two maps were overlaid together into one map 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 facilitates the workers to accurately record where they are working, record work they have done in the different areas of the reserve every day. This 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)

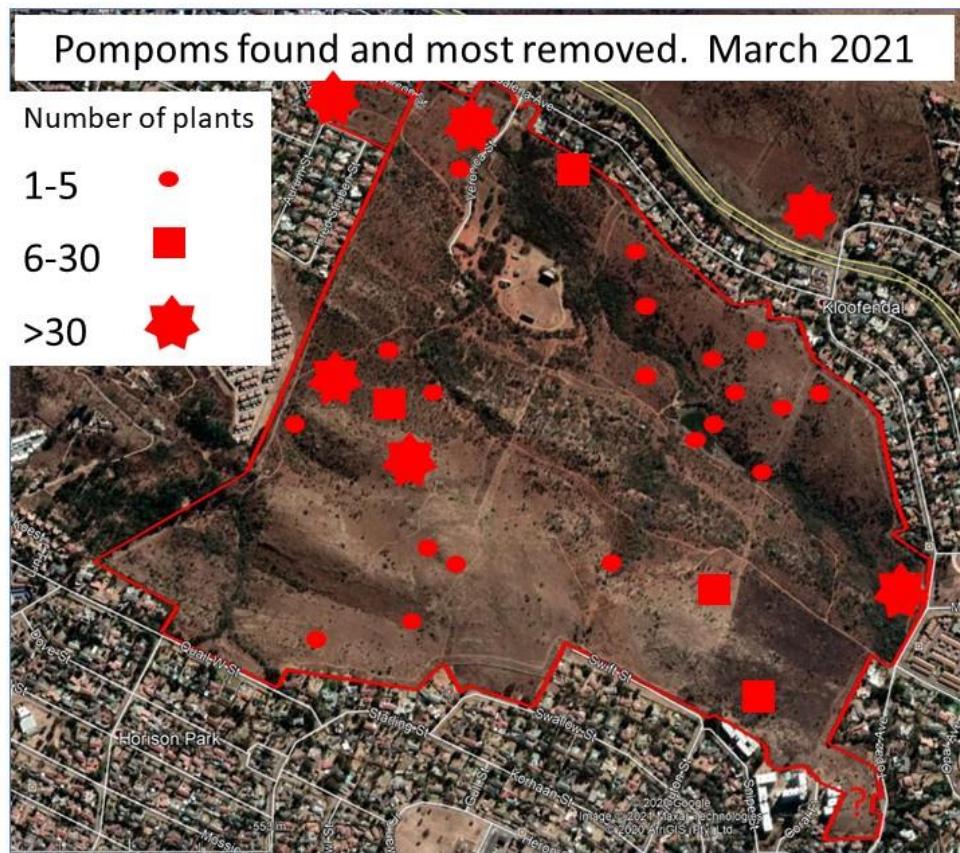


Map of Kloofendal with the quadrats, areas worked on 11th November 2020 until 24<sup>th</sup> January 2021,  
highlighted in yellow



11<sup>th</sup> November until 28<sup>th</sup> March 2021 – AIP control work, pink, has been done in most of the quadrats in  
the Kloofendal Nature Reserve

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.

First of all, teaching the workers what the alien invasive plants are, one species at a time, how to identify them and distinguish them from similar indigenous plants, the reason why AIPs are harmful to the natural environment. Methods of controlling them are listed below:

- (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.

	
Digging out roots with minimal disturbance of the soil. Root stock and plant are left to decompose amongst the grass	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.

AIP Control of Pompom weed (*Campuloclinium macrocephalum*)

- (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.

			
Working on big Jerusalem Cherries with a tree popper	Black Woods having been removed with the tree poppers – see all the root stocks	Environmental monitors learning how to use a tree popper, here working on a big Lantana	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

- (iii) Girdling – for bigger trees – ringbark stem up to between  $\frac{1}{2}$  and 1 meter above the ground, and strip off the bark all the way down 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 sown off 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 to get access to stem of the trees.

Black wattle being “girdled” Ringbarking and stripping bark down to roots		Black Wood having been girdled – hard work!

- (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.

Black wattle stumps carefully painted with Kaput herbicide. No surrounding other plants were painted.	AIPs that have been sprayed with herbicide in the past, bare soil indicating that other plants around them have died too

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.

- (v) Regular follow up is essential in AIP control.

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

		
Vigorous regrowth from an attempt to remove Black Wood a few years ago. Just cutting or sawing it down will not work, poisoning often does not work either. Regular follow up (every 6 weeks) removing any regrowth, will eventually kill the plant.		Close-up, showing cut young Black Wood tree with lots of new growth - coppicing

## Appendix 4. Record keeping of number of alien invasive plants removed during days worked and the location in 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 AIPs which we would be working on, and to show the teams the serious need for AIP control in Kloofendal, the impact the AIPs 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 AIPs 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 the flowering and seeding times of AIPs, removing AIPs before they develop fruits and cast seeds. Some AIPs 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 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 poisonous, Bugweed has fine hair on its leaves that can cause a rash and itching, so wearing of leather gloves, protective clothing and masks were recommended as a precaution. Also handwashing before eating, the berries of Jerusalem Cherries are poisonous, so handwashing is required after working with Jerusalem Cherries. As the programme continued, FroK supplied the workers with stronger leather gloves up to the elbow, as the ones issued by JCPZ had gotten holes in them.

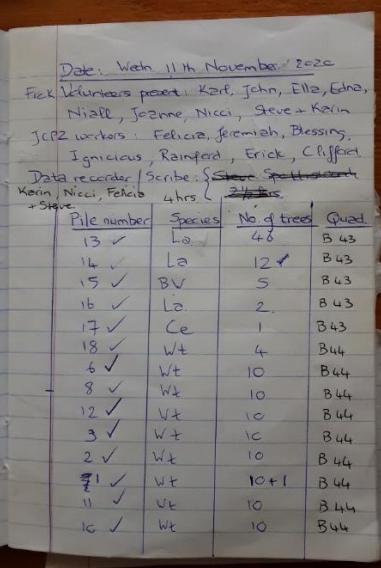
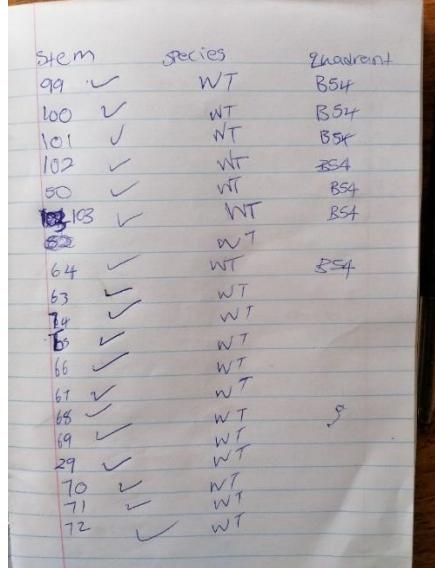
The herbicide Kaput was used initially on Black Wattle (*Acacia mearnsii*) which were too big to come out with a tree popper, later the ringbarking and stripping bark to the roots was used on the Black Wattle trees, and Kaput only used on the toxic *Cestrum laevigatum*, on those trees too big to be able to be taken out with a tree popper

Kaput is a gel applied with a paintbrush to the freshly cut AIP stem, this prevents poisoning other indigenous plants in the vicinity which is easily possible when using a herbicide spray. Equipment needed for herbicide application are protective gloves, mask, safety glasses (the workers did not want to wear the safety glasses), 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, number of plants in each pile and the quadrat number.

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

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 much improved from 7<sup>th</sup> January onwards.

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

From 7<sup>th</sup> January 2021 onwards data (records of work done) was sent to me by WhatsApp on the Friends of Kloofendal cell at the end of each working day, as well as photographs of plants removed i.e. pictures of the root stock, the debarked tree stump or in case of Cestrum, the tree stump painted with herbicide, application done within 5 minutes. FroK has provided the EPWP people sending the data with airtime data for their phones.

Wt = Wattle tree = Black Wattle

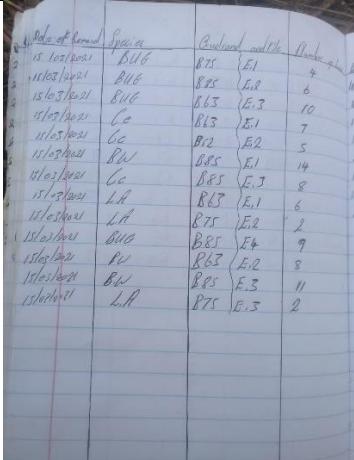
Ce = *Cotoneaster*

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 Quad = quadrat, which is the 100 by 100 metre square (one hectare) 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.

More recent recordings of work done:

			
Records from Erick , pile numbers E1 etc	Records from Ronald, pile numbers P1 etc	<i>Cestrum laevigatum</i> (CL)	
			
<i>Cestrum laevigatum</i> (CL)	Lantana (LAN or LA)	Black Wood (BW)	Cotoneaster (CE)
			
Bugweed (BUG)	Young Black Wattles (WT=Wattle Tree)	Stripping bark down to the roots	Cotoneaster (CE) girdled (bark stripped down to roots)

Appendix 5. Record of hours worked in the field by FroK Volunteers on the AIP Project 11<sup>th</sup> November 2020 until 24<sup>th</sup> January 2021

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

Above records were kept initially by the volunteers until 24th January, this was discontinued.

## 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 - rondeklits	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 in recent years.
<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 Galen a street side of reserve
<i>Plantago lanceolata</i>	Plantago	Replacing grass in Kloofendal amphitheatre lawn, but not as aggressively as the Richardia. Individual plants were assiduously weeded by hand for many years.
<i>Podranea ricasoliana</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 along paths
<i>Zinnia peruviana</i>	Zinnia	Spreading in various sunny areas.

Invasive pioneer alien weeds like Black Jacks, Khakibos/ weed, *Salvia tiliifolia*, Cape Gooseberry should be slashed before they seed.

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. There are various indigenous bush encroachers such as *Lippia javanica*, *Diospyros lycioides*, and the alien invasive ground covers such as *Richardia brasiliensis* (very invasive, replacing grass in the amphitheatre lawn!), *Plantago lanceolata*, Devil's thorn (*Tribulus terrestris*), Paper thorn (*Alternanthera pungens*) and Carrot weed (*Guillememinea densa*) which are mainly a problem in the amphitheatre lawn area.