

INVASIVE SPECIES MONITORING, CONTROL AND ERADICATION PLAN

Management Unit: KORSMAN BIRD SANCTUARY, Ekurhuleni Metropolitan Municipality

AS REQUIRED BY SECTION 76 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) (NEMBA) FOR SPECIES LISTED AS INVASIVE IN TERMS OF SECTION 70 OF THIS ACT

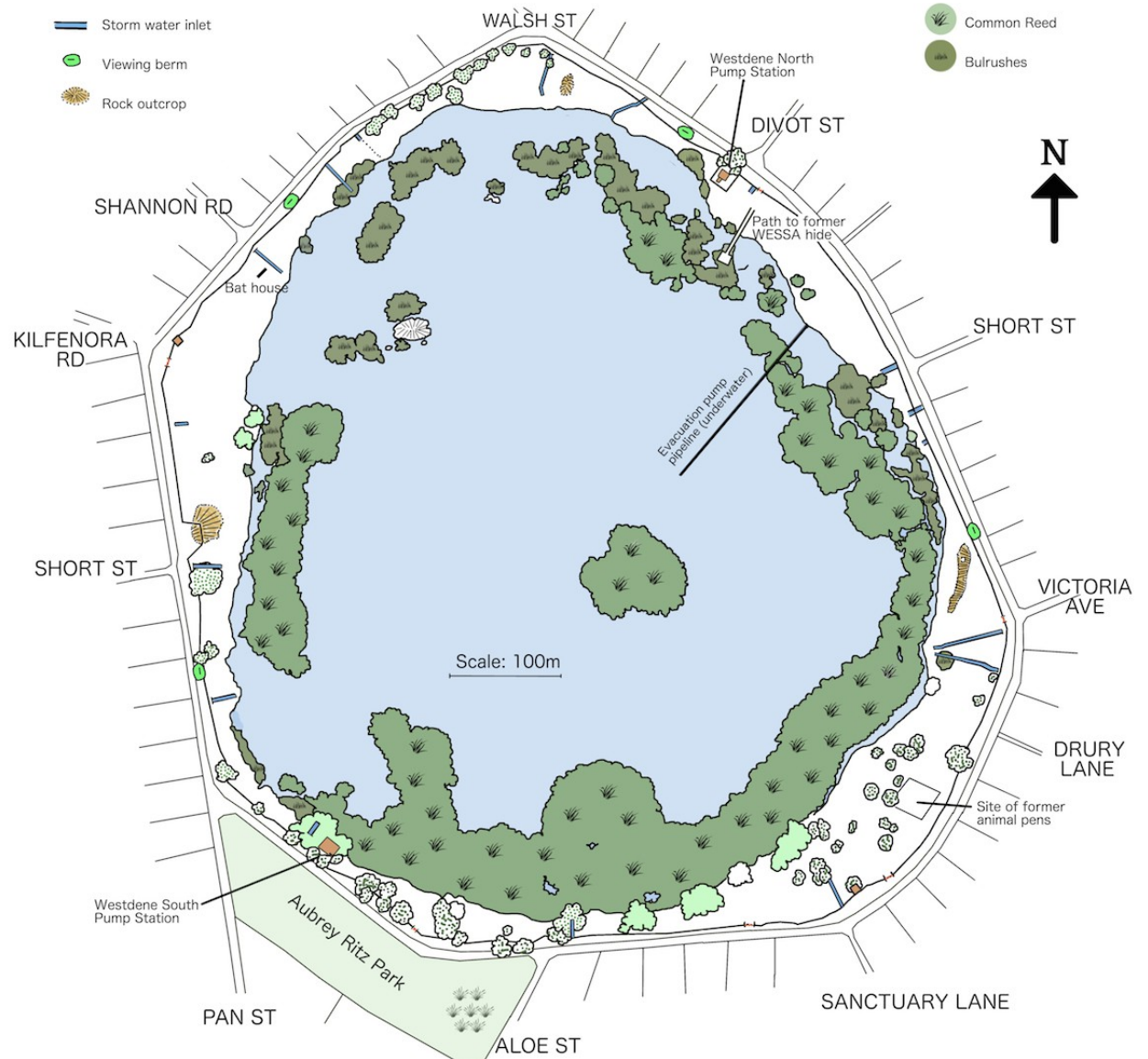
Location:

Korsman Bird Sanctuary
Erf 3660 Benoni Westdene
Encircled by The Drive

Management:

Cared for by Korsman Conservancy, a Section 21 company, on behalf of and in conjunction with the Ekurhuleni Metropolitan Municipality.

Report compiled by Jane Trembath, Chairperson, Korsman Conservancy.



BACKGROUND and EXECUTIVE SUMMARY

Korsman Bird Sanctuary falls into the Grassland Biome, just within the distribution limit of endangered Soweto Highland Grassland. Only traces of this grassland remain. The Sanctuary area is 49Ha of which approximately 37Ha is wetland. The key vulnerability to invasion is loss of biodiversity.

- The terrestrial area (grassland) is degraded by kikuyu (encroaching from the verge outside the fence) and many categorised invasive plants and weeds. Many invasive plants are seeded from birds, as there are numerous uncontrolled invasive plants in the surrounding suburb.
 - Invasive and alien trees in the grassland were historically planted. Although many have been removed, seed banks remain.
- The wetland and transitional zone invaders are *Phragmites australis* and *Typha capensis*. These were planted in the 1950's, when the area was fenced and declared a Bird Sanctuary. The stands spread every year, and have been encroaching on the grassland, leading to further terrestrial degradation. A secondary transitional zone invader is the uncategorised *Persicaria hydropiper*.
- Numerous other invasive plant species are carried into the Sanctuary via the 17 inlets of the storm water system, of which the catchment is approximately 200Ha. These are more localised to the storm water inlet surrounds.

The Sanctuary is presently run by the volunteers of the non-profit Korsman Conservancy, who have identified 46 categorised invasive plant species and actively managed their removal since 2014. A detailed map of the location of each invasive species can be drawn up by Korsman Conservancy.

Methods are manual as far as possible. Herbicides are used responsibly. Large invasive trees that are killed are left standing to create bird habitat.

Korsman Conservancy requires urgent and considerable support from Ekurhuleni for the large projects of controlling *Phragmites australis* and *Typha capensis*.

Three tables in this report: 1. Categorised invasive plants, 2. Uncategorised but locally invasive plants, 3. Fauna.

Deviation from Framework Guidelines 3.4: Before Korsman Conservancy, little removal took place historically. Where known it is included in Current removal methods.



Cirsium vulgare infestation, 2013



Manual removal of *Fraxinus americana* sapling forest by tree popper, 2014

1. CATEGORISED INVASIVE PLANT SPECIES

	SCIENTIFIC NAME	COMMON NAME	CAT	Extent	Priority	Risk of invasion	Current measures to monitor, control or eradicate Estimated efficacy: 100% = no present specimens.	Indicators of control / success over 5 years
1	Acacia dealbata	Silver wattle	2	1 tree	L	L	None, as tree has not spread.	None unless tree reproduces.
2	Acacia Melanoxylon	Australian Blackwood	2	0%	L	L	100% Controlled since 2015. All large specimens frilled and triclopyr/diesel mix applied as backup. Saplings: Pulled by hand or tree popper.	Maintenance phase. Monitor seed bank areas.
3	Ageratum houstonianum	Mexican ageratum	1b	0%	L	L	Isolated specimens first discovered in 2016 at Victoria inlet. Hand pulled. 100%.	No plants allowed to go to seed.
4	Alisma plantago-aquatica	Mud plantain	1b	0%	L	L	First discovered 2016 in Drury Lane inlet. Control method to be determined. 0% controlled.	Method to be determined by 2017.
5	Araujia sericifera	Moth catcher vine	1b	2%	H	M	Controlled since 2013 by hand pulling. Root section of of larger specimens removed. 50% reduction in germination in 2016.	Maintenance phase. Monthly monitoring in summer.
6	Azolla filiculoides	Red water fern	1b	N/a	L	L	None, but infestation cleared by itself.	None
7	Bryophyllum delagoense	Chandelier plant	1b	1%	M	M	Infestation limited to Victoria St rockery. Controlled since 2016. Hand pulled before flowering but unknown seed bank remains. 75% of plants removed in 2016.	Target will be set according to future experience with seed bank.
8	Campuloclinium macrocephalum	Pompom weed	1b	1%	H	M	Controlled since 2013. All discovered specimens dug out by root. Annual infestation has declined by 50% in three years.	Maintenance phase to reduce 2021 regrowth by 90% from approximately 60 plants in 2015.
9	Canna indica	Canna	1b	1%	L	L	Plants dug out since 2016. 60% efficacy. Infestation limited to area by Westdene South pump station.	Infestation to decline by 90% in 2019 with annual maintenance.
10	Casuarina equisetifolia	Horsetail tree	2	1%	L	L	Trees felled before 2009. Coppicing successfully treated in 2016 with diesel/triclopyr mix.	Maintenance phase. Ensure trees positively killed by 2018.
11	Cestrum parqui	Chilean cestrum	1b	1%	L	L	Dug out 100% of plants of small infestation opposite No 8 The Drive.	Maintenance phase. Annual monitoring.
12	Cirsium vulgare	Spear Thistle	1b	5%	H	H	Severe infestation controlled since 2013 by manual removal. Infestation already reduced by 90%.	Aim for total extirpation by 2021 with annual management between October and May.
13	Cortadera selloana	Pampas grass	1b	1 plant	L	L	Sprayed in 2015 by Ekurhuleni Wetlands. One remaining plant at Pan St corner has traces of growth. 99% efficacy.	Maintenance phase. No living plant by 2018.

14	<i>Cortadera jubata</i>	Purple pampas grass	1b	0%	L	L	Three plants killed by glyphosate spraying in 2015 by Ekurhuleni Wetlands. 100% efficacy.	Maintenance phase. Annual inspection.
15	<i>Cotoneaster</i>	Exact species unknown	1b	0%	L	L	2015: Large specimen cut by Ekurhuleni Cemeteries and Conservation, stump treated with imazapyr by K.C. Smaller specimens manually removed by K.C. Infestation limited to area opposite Aubrey Ritz Park.	Maintenance phase. Annual inspection.
16	<i>Cuscuta campestris</i>	Dodder	1b	1%	L	L	Not yet controlled.	Method to be determined.
17	<i>Datura ferox</i>	Large thorn apple	1b	1%	M	L	Controlled since 2013. All specimens manually removed on discovery. No seeding since then.	Maintenance phase. Summer monitoring and removal.
18	<i>Datura innoxia</i>	Downy thorn apple	1b	1%	M	L	Controlled since 2013. All specimens manually removed on discovery. No seeding since then.	Maintenance phase. Summer monitoring and removal.
19	<i>Duchesnea indica</i>	False strawberry	1b	1%	L	L	Infestation discovered in 2016 in Walsh St grassland. 0% controlled. Method to be determined.	Remove infestation by 2018/9 and enter maintenance phase.
20	<i>Flaveria bidentis</i>	Smelter's bush	1b	0%	L	L	Isolated specimens discovered in 2016. Slashed by brush cutter.	Maintenance phase. Summer monitoring and removal.
21	<i>Gleditsia triacanthos</i>	Honey Locust	1b	1 mature tree	L	L	Large trees historically felled (year unknown). Coppicing controlled 50% since 2015: sprayed with triclopyr/water mix. Remaining large tree opposite Aubrey Ritz Park resistant to bark treatment of diesel/triclopyr mix. Medium trees killed by bark treatment. Saplings manually removed.	Maintenance phase of new growth. Monitor extent of annual seeding before decision on killing of remaining tree.
22	<i>Iponomea purpurea</i>	Purple morning glory	1b	1%	M	M	Controlled since 2015 by manual removal but seed bank remains. Estimated efficacy 20%. Grows in disturbed areas. Infestations opp Aubrey Ritz, Shannon Rd inlet, Victoria inlet.	Determine percentage of target regrowth reduction with more experience.
23	<i>Iris pseudacorus</i>	Yellow flag iris	1a	0%	H	H	Full extent to be determined. Stands dug out manually since 2016 as ID confirmed. Infestation expanding. Drury Lane inlet, Aloe St inlet.	Assess full extent by 2017/8. Seeds carried in through storm water inlets.
24	<i>Ligustrum lucidum</i>	Chinese wax-leaved privet	3	1%	L	M	Controlled since 2015. Saplings removed in brush clearing areas. Seed bank remains and constant re-seeding by birds from many trees in the suburb.	Unable to set target as extent of seed bank and bird reseeded unknown.
25	<i>Linaria genistifolia</i>	Dalmatian toadflax	1b	0%	L	L	Isolated plants discovered in 2015, all hand pulled.	Maintenance phase. Monitoring.
26	<i>Malva dendromorpha</i>	Tree mallow	1b	0%	L	L	One specimen in storm water inlet, hand pulled in 2014. 100%	Maintenance phase. Summer monitoring and removal.
27	<i>Melia azedarach</i>	Syringa	1b	0%	L	L	Controlled since 2014. Coppiced stumps sprayed	Maintenance phase. Twice yearly

							with triclopyr/water mix. Saplings manually removed.	inspection and removal.
28	Mirabilis jalapa	Four o'clocks	1b	0.5%	H	H	One infestation at Aloe St chestnut, controlled since 2014 by manual removal. Reduction 50%. Infestation at Victoria inlet controlled since 2015 with glyphosate spraying as digging would damage inlet bank. Efficacy presently unknown.	Reduce regrowth by 30% annually to enter maintenance phase by 2019/20.
29	Morus alba	White Mulberry	3	0%	L	L	Controlled since 2014. Saplings manually removed. Large trees felled and stump treated with imazapyr. Medium trees stem injected with imazapyr. Seed bank remains.	Maintenance phase. Annual inspection and removal.
30	Nasturtium officinale	Watercress	2	0%	L	L	Species just discovered in Drury Lane inlet. Will be manually removed in Spring 2016.	New species, no target set.
31	Pennisetum clandestinium	Kikuyu grass	1b	2Ha	H	H	Controlled since 2016. Selected patches and 1m strip along the fence, sprayed with glyphosate. Some sprayed patches burnt in 2016 during ecological burns. 10% of area has been controlled.	Phased removal of 20% per year to total area less than 0.5Ha by 2021.
32	Phytolacca dioica	Belhambra	3	0%	L	L	Large specimens historically cut, year unknown. Manual removal since 2014 of coppiced roots and small plants. All presently removed.	Maintenance phase. Twice yearly inspection and removal.
33	Phytolacca octandra	Inkberry	1b	0%	L	L	Occasional specimens 100% manually controlled since 2014	Maintenance phase. Summer monitoring and removal.
34	Ricinus communis	Castor oil plant	2	0%	L	L	Occasional specimens 100% manually controlled since 2014	Maintenance phase. Summer monitoring and removal.
35	Robinia pseudoacacia	Black locust	1b	1%	H	H	Controlled since 2012 by spraying. Manual removal ineffective. Infestation has reduced by 80%.	Maintenance phase. Annual target of regrowth reduction 50%. Extirpate by 2021.
36	Salix Babylonica	Weeping willow		5%	H	M	Locally invasive. Infestation controlled by 40% since 2014. Parent trees not treated. Children stem injected with imazapyr. Saplings manually removed.	Control 100% small trees and side trunks by 2018/9 to enter maintenance phase.
37	Salvia tiliifolia	Lindenleaf sage	1b	0%	M	L	Infestation under trees opposite No 6 discovered in 2015. Limited manual control so far. 0% controlled.	Annual control to commence in 2017. Determine extent of infestation to set target.
38	Sambucus nigra	Elderberry	1b	One tree	L	L	No control. Tree has not reproduced.	Tree to remain unless it spreads.
39	Sesbania punicea	Red sesbania	1b	0.5%	M	M	Large trees were historically felled but seed banks remain. Localised infestations of saplings hand	Maintenance phase. Twice yearly inspection and removal.

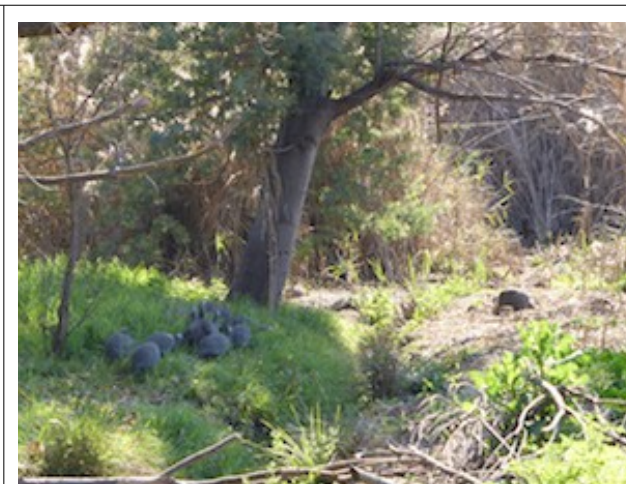
							pulled since 2013. 100%.	
40	<i>Solanum mauritanium</i>	Bugweed	1b	0.5%	M	M	Controlled since 2013. Presently 100% removed but re-seeded by birds from surrounding infested properties.	Maintenance phase. Summer monitoring and removal.
41	<i>Solanum pseudocapsicum</i>	Jerusalem cherry	1b	1%	M	M	Controlled since 2013. Infested patches manually removed. 30% reduction in regrowth.	Target reduction in regrowth 90% by 2021.
42	<i>Tipuana tipu</i>	Tipuana	3	1 tree	L	L	None. Tree has not reproduced.	None planned.
43	<i>Toxicodendrum succadenuem</i>	Wax tree	1b	0%	L	L	Occasional specimens 100% controlled by hand since 2014	Maintenance phase. Summer monitoring and removal.
44	<i>Verbena bonariensis</i>	Purple top	1b	3%	M	M	Controlled since 2013. Manual removal. 20% reduction.	Target 90% reduction in grassland by 2021. Leave patches in otherwise degraded areas for butterfly observation.
45	<i>Verbena brasiliensis</i>		1b	0.5%	M	L	Species identified in 2016. No control yet.	Target 90% reduction in grassland by 2021.
46	<i>Xanthium strumarium</i>	Large cocklebur	1b	0%	L	L	Manually controlled since 2014. Seed bank remains. Extent of growth reduction presently unknown.	Maintenance phase. Summer monitoring and removal.



Araujia sericifera at Aloe St inlet, 2013



Status in April 2016 – other weeds



After further clearing, May 2016

2. PLANTS UNCATEGORISED, BUT LOCALLY INVASIVE

	SCIENTIFIC NAME	COMMON NAME	Av dens	Priori ty	Risk	Previous control measures / Efficacy	Indicators of control / success over 5 years
1	<i>Acer buergerianum</i>	Chinese maple	1%	H	L	Trees historically felled, seed bank remains. Coppiced stumps required further cutting by Ekurhuleni then stumps were treated by K.C with imazapyr. Saplings manually removed. 99%.	Maintenance phase. Twice yearly inspection and removal.
2	<i>Bidens pilosa</i>	Spanish blackjack	3%	H	H	Controlled since 2015. Large stands repeatedly slashed by brush cutting between February and May to prevent seeding. Efficacy presently unknown, except for small area opposite No 6 The Drive which reduced by 75% in two years.	Aim to reduce reseeding by 80% by 2021.
3	<i>Erigeron chilensis</i>		1%	H	H	Species identified in 2016. Highly invasive along shore. Large seed bank. Stands slashed by brush cutting. Very difficult to hand pull. Infestation expanding.	Research alternative control methods in 2016/7. Aim to reduce infestation by 90% by 2021.
4	<i>Erigeron bonariensis</i>	Fleabane	5%	H	M	Controlled in grasslands since 2015. Hand pulled. Infestation reduced by 50%.	Reduce annual regrowth by 50% to enter maintenance phase by summer 2019/20.
5	<i>Fraxinus americana</i>	American Ash tree	1%	H	L	Trees historically felled, seed bank remains. Bark stripping of medium trees ineffective, subsequently bark treated with triclopyr. Dense localised stands of saplings manually removed by tree popper. Only effective when entire root removed. 99%.	Maintenance phase. Twice yearly inspection and removal.
6	<i>Heimia myrtifolia</i>		1%	H	M	Identified in 2015. Plants and stands manually removed with entire root. Large woody bushes cut and stump treated with imazapyr. Estimated efficacy 90%.	Maintenance phase. Twice yearly inspection and removal.
7	<i>Persicaria hydropiper</i>		1%	H	H	Species identified in 2016. Large stands slashed by brush cutter. Efficacy as yet unknown.	Target to be set. More information about this species needed.
8	<i>Phragmites australis</i>	Common reed	12 Ha (pan) 1 Ha (land)	M	H	Controlled in 2014/5 by Ekurhuleni – Environmental: Wetlands by spraying. Controlled in 2015/6 by K.C. hand spraying with glyphosate on shore areas only, with limited efficacy. Efficacy 40% on shore after two years of treatment. Infestation continues to spread and requires aggressive control by spraying twice annually.	Reduce total area by 50%, away from shore line, by 2021. No reeds alive on terrestrial areas by 2018.

						Pan water level must be managed by Water and Sanitation as requested by K.C. High water level causes encroachment into grassland.	
9	<i>Physalis angulata</i>		1%	L	L	Controlled by hand since 2016. Weed spreading. Full extent of spread to be determined.	Target to be set once extent determined.
10	<i>Populus deltoides</i>	Cottonwood	1%	L	L	Mostly planted outside fence. Specimens inside fence controlled since 2015. Small trees and offshoots of large trees stem injected with imazapyr. Saplings hand pulled. 60% controlled.	Maintenance phase.
11	<i>Rumex crispus</i>	Curly Dock	1%	M	M	Controlled since 2016. Weeds slashed by brush cutter before seeds ripen. Large seed bank, growing in degraded areas where reeds were sprayed.	Reduce infestation by 60% by 2021.
11	<i>Tagetes minuta</i>	Khakibos	1%	M	M	Manually controlled by hand pulling and slashing since 2013, control areas increased every year.	Maintain 100% of areas by 2019.
12	<i>Typha capensis</i>	Bulrush	5 Ha (pan) 1 Ha (land)	H	H	See as per <i>Phragmites australis</i> . Efficacy 30% on shore after two years of treatment. Environmental: Wetlands needs strong support from Ekurhuleni to manage this invasion.	Reduce total area in water by 75% by 2021. No bulrushes alive on terrestrial area by 2019.
13	<i>Ulmus parvifolia</i>	Chinese Elm	1%	M	L	Controlled since 2015. Large trees stem injected with imazapyr. Saplings manually removed by tree popper. Seed bank remains.	Maintenance phase. Twice yearly inspection and removal.

3. FAUNA

	SCIENTIFIC NAME	COMMON NAME	Cat	Extent	Priority	Risk of invasion	Current control method / efficacy	Indicators of control / success over 5 years
1	<i>Acridotheres tristis</i>	Common Myna	3	Widespread	L	M	Not yet controlled	To be determined
2	<i>Anas platyrhynchos</i>	Mallard	2	1 pair	H	M	Not yet controlled. GDARD notified.	To be determined. May be part of flock from Homestead Dam.
3	<i>Cyprinus carpio</i>	Common carp	2	Numerous. Estimated to be in the hundreds.	M	H	Carp first seen in 2014, since the pan last dried up in 2004. Not yet controlled.	To be determined with assistance from Environmental: Wetlands.
4	<i>Harmonia axyridis</i>	Harlequin lady beetle	1b	Widespread			Specimens manually controlled when found. Efficacy unknown.	Unable to determine