



# David Styles

## Vegetation Surveys, Advice and Consulting

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23 November 2015

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Dear Carla

### **REPORT ON VEGETATION ON A PROPOSED LANDFILL SITE AT CATO RIDGE**

#### **1. Introduction**

I have been asked by WSP to present a report on vegetation within an area at Cato Ridge proposed for a landfill site. The site includes the environs of the old Cato Ridge Airfield that was decommissioned some years ago.

#### **2. Description of area**

The site forms part of a flat-topped Natal Group sandstone derived plateau that occupies much of Cato Ridge north of the N2 freeway. The vegetation on the plateau is nearly entirely comprised of grassland. Beneath the plateau the geology transitions to Dwyka Group tillite and granite and the vegetation is more diverse, comprising both thicket and grassland. The grassland is, however, not like that on the plateau in that it has a different species composition and is more degraded. Vegetation on the plateau has become fragmented by industrial and to some extent residential development. As a result of these and associated impacts, much of this grassland is also transformed, degraded and in poor condition. However, there are also areas in which there is grassland in fair to good condition that indicate the composition of grassland as it once occurred more widely on the plateau.

The eastern part of the proposed landfill site comprises sandy soil with little or no conspicuous rock exposure. Much of this is also seasonally damp. Sandstone outcrops begin to appear travelling west, with the western edge the escarpment very rocky.

## **2. Provisos**

The site was visited during drought conditions. Grass had been burned the winter before and combined with grazing, little replacement was evident. As a result, the grass was short and often sparse. There was poor expression and flowering of herbaceous and geophytic plants, with much of the presence inconspicuous or considered not evident at all.

However, this report draws on information from an MSc study comprising surveying of grasslands at Cato Ridge during which fieldwork continuing until March 2014. During this survey, 234 plots were surveyed at Cato Ridge with 20 on next to the site. The site and the position of lots is shown in Appendix 1. During the surveying of plots, a different picture was apparent, including moderate species diversity on parts of the site together with occurrence of rare and red listed species. The focus of the MSc was primarily plot-based, and although this was combined with reconnaissance and walk-through of grassland that included this site, it did not have as its objective the mapping of individual occurrences of rare and red listed plant species. As a result, while it is possible to report on rare and red listed species that occur on the site, together with approximate area of occurrence, it is not possible to provide a map showing actual occurrences.

## **3. Vegetation type**

The grassland at Cato Ridge is mapped as Ngongoni Veld in the National Vegetation Map, where recorded as a Vulnerable vegetation type (Mucina & Rutherford 2006). However, the grassland is considered to be, and is mapped by the Ethekwini Municipality's Environmental Planning and Climate Protection Department as KwaZulu-Natal Sandstone Sourveld, an Endangered type.

Mucina & Rutherford report that KwaZulu-Natal Sandstone Sourveld occurs on a Natal Group sandstone substrate, whereas Ngongoni Veld occurs on other geologies, including Dwyka Group tillite. These authors provide a list of species that are important, biogeographically important or endemic in KwaZulu-Natal Sandstone Sourveld and a much smaller list of important for Ngongoni Veld. Based on results from 234 plots surveyed in grassland at Cato Ridge, it was found that grassland on sandstone had a different composition to that on other geologies in the area (mainly tillite).

The list of species provided in Mucina & Rutherford list (2006) was studied and it was apparent that some of these species are included in error, as they are either not species that occur in grassland or in the area of distribution of KwaZulu-Natal Sandstone Sourveld. Once these errors were removed comparisons were made. It is important to note that a number of the endemic species cited for Kwazulu-Natal Sandstone Sourveld have very small and localized distributions and so even within the mapped area of this grassland type only some may be present on a particular site, or may not be so at all. The results show that grassland on a Natal Group

sandstone substrate at Cato Ridge has the closest correlation with KwaZulu-Natal Sandstone Sourveld as follows.

**Table 1.** Grassland on a Natal Group sandstone substrate at Cato Ridge: Correlation with species cited as important, biogeographically important and endemic in Mucina & Rutherford (2006).

<b>Important (25 species)</b>	17 (68 % )
<b>Biogeographically important (17 species)</b>	9 (52.9 % )
<b>Endemic (7 species)</b>	2 (28.6 % )

It is therefore held that grassland on a Natal Group sandstone substrate at Cato Ridge is KwaZulu-Natal Sandstone Sourveld, even though it is not mapped to this type in the National Vegetation Map (Mucina & Rutherford 2006).

#### 4. The proposed landfill site

Grassland on the site can be differentiated to two kinds. The eastern part of the site comprises sandy soils that are in many places seasonally damp (not evident at the moment due to drought conditions). The species composition differs from that on the western part of the site where drier and sandstone outcrops begin to appear. The 30 most abundant herbaceous species in grassland in the eastern versus the western part of the site are presented in Appendix 2. Basic information concerning species is as below.

**Table 2.** Species diversity in 10 m<sup>2</sup> plots on and next to the site.

	<b>Eastern area (10 plots)</b>	<b>Western area (10 plots)</b>
	<b>Number of herbaceous species</b>	<b>Number of herbaceous species</b>
<b>Maximum</b>	28	27
<b>Minimum</b>	10	14
<b>Average</b>	18	21

Although species diversity in the different parts of the site is well evident in Appendix 2, the following species are noteworthy.

**Table 3.** Noteworthy species on and immediately adjacent to the site. Red list status follows Raimondo et al (2009). Many of these species are shown in photographs attached in Appendix 3, most taken on or next to the site.

<b>Species</b>	<b>Endemism status</b>	<b>Red list status</b>	<b>Population information</b>
Agathisanthemum chlorophyllum (Hochst.) Bremek. var. chlorophyllum	Endemic to broad KwaZulu-Natal coastal escarpment		Common in grassland on the site

Aloe parviflora Baker	Nearly endemic to the Durban escarpment		Scattered plants, mainly but not only in the western, rocky part
Brachystelma pulchellum (Harv.) Schltr.	Mainly endemic to the Durban escarpment	Near Threatened	Large population probably comprising several hundred individuals in the western part but with some plants in deeper, sandy soil
Chaetacanthus sp. nov. = D.G.A. Styles 3822, 3919, 3950, 3972, 3973 (NH)	An apparent local endemic, treated further below		Probably several hundred individuals, mainly but not only in the western, rocky part
Delosperma suttoniae Lavis	A KwaZulu-Natal endemic	DDT	A rare species known from few collections. A pink-flowered species not to be confused with the white-flowered D. lineare L.Bolus that is far more common on the site
Eriosemopsis subanisophylla Robyns	Cited as a Pondoland Centre endemic, with Cato Ridge the northern known distributional limit.	Vulnerable	Scattered but widespread on the western part of the site, once sandstone outcropping begins to occur
Lotononis solitudinis Dummer			
Pachycarpus coronarius E.Mey	Mainly known from the Pondoland Centre, with Cato Ridge apparently the only locality from which known either to the north, or in the Ethekewini Municipal Area		Scattered plants, mainly but not only in the western, rocky part
Senecio albanopsis Hilliard	Endemic to the Pondoland Centre and Natal Group sandstone grassland to the north, but south of the Tugela River		Only in the rocky, western part
Senecio exuberans R.A.Dyer	Endemic to the area between the Durban	Endangered	Scattered plants in both eastern and western parts

	escarpment and Pietermaritzburg east.		
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Noteworthy species on the eastern part of the site are *Agathisanthemum chlorophyllum* (Hochst.) Bremek. var. *chlorophyllum* with *Lotononis solitudinis* Duemmer locally common where the soil is damp. This latter species is species described as rare (Van Wyk 1991). The number of noteworthy species is larger in the western part, once Natal Group sandstone outcrops begin to occur. *Brachystelma pulchellum* (Harv.) Schltr., endemic to rocky KwaZulu-Natal Sandstone Sourveld and red listed as Near Threatened. Of biogeographical interest is *Helichrysum asperum* (Thunb.) Hilliard & Burt var. *comosum* (Sch.Bip.), which is usually found on coastal sand dunes but extends inland to a few sites where there are sandy soils. Two red listed species are widely scattered and occur in both the eastern and western parts of the site. These are *Senecio exuberans* R.A.Dyer, which is Endangered, and *Boophone disticha* (L.f.) Herb. (Declining).

## 5. Undescribed species

The site and close surrounds are perhaps more important for the occurrence of two undescribed species that may be local endemics, photographs of which appear in Appendix 3. Local endemics are particularly conservation important as impacts at a site level may then be global and existential, whereas this is not usually so for plants with wider distributional provenance.

- *Chaetacanthus* sp. nov. has been well collected from the site and the close surrounds, with material lodged at the KwaZulu-Natal Herbarium. Prof. Kevin Balkwill, an expert on the genus based at the University of the Witwatersrand advises that he believes this is an undescribed, new species (pers. comm.). It distinct from all other species occurring in South Africa, including the widespread *Chaetacanthus burchellii* that also occurs in these grasslands. It differs in its much large flowers and stoloniferous habitat, with stems becoming prostrate once they have grown out. This species is associated with sandstone pavements or with sandy soil near extensive outcropping. It also occurs on a land slated for industrial development between 1 000 and 1 800 metres away from the site (as shown in Appendix 1.2; see also comments on cumulative impacts, below).

*Chaetacanthus* sp. nov. occurs nearly entirely at these sites, and in spite of intensive searching of other sandstone sites south of the N2, including at Hammarsdale, has only been found elsewhere on one sandstone outcrop, where the subpopulation is very small (c. 10 plants). Plants with this appearance also occur in small numbers on the Table Mountain, a flat-topped Natal Group sandstone feature about 8 km to the north. However, plants were in poor condition and proper confirmation is required. Herbaceous diversity on Table Mountain is severely threatened by overgrazing as persons in the adjoining community have converted the mountain top into a cattle pasture, which has been fenced off for this purpose.

- An undescribed *Pachycarpus* species with affinity to *P. dealbatus* occurs within 1 km of the site. It was collected twice during surveying, with material lodged at the KwaZulu-Natal Herbarium, but the small population appears to have been

destroyed by grazing. However, a thorough search is needed to establish if more survive elsewhere in the environs. The collections are being studied by Dr Ashley Nicholas of the University of KwaZulu-Natal, Westville Campus, with a view to description. According to Dr Nicholas it has been collected once before from Cato Ridge and there are no other known collections. It may be a very rare local endemic.

The site has not been investigated exhaustively and more plots were surveyed in grassland a little further away, between 500 to 1 800 six to the south and south-east, where other red listed species were found. At least five other red listed species were found in these plots. Due to the similarity and proximity of this grassland, the occurrence of at least some of these species is considered likely on this site.

**Table 4.** Red listed species in grassland similar to and within 2 km of the site.

Argyrobium longifolium (Meisn.) Walp.	Endemic or nearly-endemic to the KwaZulu-Natal escarpment between about the Mzimkulu and the Tugela Rivers	Vulnerable
Brachystelma sandersonii (Oliv.) N.E.Br	Endemic to coastal KwaZulu-Natal, where it usually occurs along the coastal littoral, but extending in places up the coastal escarpment where there are sandy soils	Vulnerable
Crotalaria dura J.M.Wood & M.S.Evans subsp. dura	Endemic to the coastal escarpment between Highflats and the Tugela River	Near Threatened
Helichrysum pannosum DC.	Endemic to the broad coastal escarpment, from about East London to the Tugela River	Endangered
Hermannia sandersonii Harv.	Known only from the broad Durban escarpment and from near Newcastle	Vulnerable
Senecio umgeniensis Thell.	A KwaZulu-Natal endemic	Threatened

Argyrobium longifolium and Helichrysum pannosum are less likely to be found on the site as they prefer mesic often slightly scrubby grassland on south- and east-facing slopes. However, there is a reasonable probability of at least some of the others occurring on the site.

## 6. Grassland quality

Although part of the grassland on the site is not secondary and contains a moderate degree of species diversity as evident in Appendix 2, it deteriorates as one travels eastwards, an eventually indeed becomes secondary. This nebulous line of transition is shown in Appendix 1.1.

## **7. Threats to grassland on the site**

Grassland on the site is severely threatened by the following.

- Large numbers of cattle can be seen on and adjacent to the site. One herd seems to be permanently sequestered on the site. These animals have been acquired and are owned by individuals living in the community off the site to the south, who, even though they appear not to own or have access to other grassland, have done so on the basis that they can pasture them on this site. This is reducing plant species diversity and abundance and can in turn convert the grassland more uniformly into secondary state over time, although there will likely be some persistence around rock outcrops. I have visited this site over many years, and it seems that the decommissioning of the old Cato Ridge Airfield and a less active presence on the land resulted in a great increase in this phenomenon.
- Sand-mining is occurring on a large part of the site, which is clearly evident in aerial photography. Mining was also seen during fieldwork, with removal occurring on a nearly daily basis. This has destroyed a minority of the grassland and will destroy more if unchecked.
- Alien trees (*Eucalyptus* sp.) have been planted in and are also invading the grassland. There is also a small but likely expanding presence of the alien tree *Populus x canescens* (Grey Poplar). If these trees are not controlled, they will also reduce the amount of grassland over time.

## **8. Other observations**

Due to drought conditions observations made before this time are included in case not noted by any faunal specialist. The site is important for the breeding of Black-winged Lapwing (*Vanellus melanopterus*), with at least three nests seen on the site in the past. These birds also breed and forage in the area of secondary grassland on the site. A photograph of a bird and nest on the site is provided in Appendix 3. One pair was seen on the site on 13 November 2015. This breeding is threatened by the cattle on the site.

## **9. Cumulative impacts**

The landfill will have wider impacts than just on the site. It will increase the amount of activity in the close surrounds and isolate the remaining grassland to the west, which will occur as a narrow band along the escarpment edge. This will interrupt ecological processes including fire, important for maintaining grassland health, species diversity and abundance. The proposed development must also be seen in the context of other development proposed at Cato Ridge.

The Cato Ridge Local Area Plan (LAP) was developed by consultants appointed by the Ethekwini Municipality, styled as the Graham Muller Associates Consortium. The LAP

provides the site with a landfill land use. The plan also allocates an industrial use to nearly all of the other grassland on this plateau that is still in fair to good condition. The conclusion must be reached that the consultants chose to disregard environmental specialist inputs concerning the quality of grassland north of the N2 and propose development in what remained regardless. Specialist biodiversity inputs were also inadequate during this process.

The biodiversity reporting for the Cato Ridge LAP occurred at a high level and involved only a few days of fieldwork instructed during the winter months. Both the time and season were unsuitable for this kind of surveying. While mapping was undertaken that identified where grassland occurred at Cato Ridge and gave it a quality ranking, it did not differentiate it to type (such as KwaZulu-Natal Sandstone Sourveld), nor could rapid surveying in winter conditions report on the composition of these plant communities or identify the location of priority species. This was a serious flaw.

As a result, it may have been believed that by developing nearly all flat land north of the N2, this was not such an unfavourable environmental outcome as it may appear now, because other open space and grassland occurs below the plateau. However, this is not KwaZulu-Natal Sandstone Sourveld, nor does it have the same species composition or many of the endemics (including the undescribed species mentioned) associated with this type, and it is also mostly more degraded.

Alternately, a decision may have been made to intensify development north of the N2, without paying much regard to conservation of this grassland, but then mostly retaining traditional agricultural use for grassland on the south side of the N2. However, there is little KwaZulu-Natal Sandstone Sourveld, at least in the Cato Ridge area south of the N2. It is also notable that the LAP allocates environmental or open space use nearly entirely or only to wetlands and closely flanking areas that are more unsuitable for development.

## **10. Recommendations**

If the landfill is implemented, it is strongly recommended that the Ethekewini Municipality undertake the following:

- A review the Cato Ridge Local Area Plan with a view excluding industrial land use in the other fair to good quality KwaZulu-Natal Sandstone Sourveld north of the N2 freeway, particularly where indicated in Appendix 1.2, so that at least some of this grassland survives and remains as habitat for priority species mentioned above, including any local endemics that may be existentially threatened by wholesale intensification of industrial and development in this part of Cato Ridge.
- The Ethekewini Municipality is not entirely in control of these other development processes, nor can it always prevent a development outcome



on a particular site, even if it concurs that species occur that should have conservation priority.

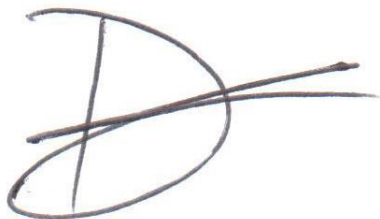
Within the Ethekewini Municipal Area, KwaZulu-Natal Sandstone Sourveld and Natal Coastal Belt vegetation is so severely threatened that the Ethekewini Municipality's 2011 Integrated Development Plan records they "require immediate protection if they are to remain extant" (Ethekewini Municipality 2011). As a result, the Ethekewini Municipality's Environmental Planning and Climate Protection Department seldom approves development into better quality KwaZulu-Natal Sandstone Sourveld, or requires that proper offsetting occurs.

If the site is developed as landfill, therefore, it is considered that a large offset will be need to be negotiated with the Ethekewini Municipality's Environmental Planning and Climate Protection Department. This may also include some pullback from the rocky outcrops to spare some of the occurrence of conservation priority species and purchase of other land at Cato Ridge, a large part of which has been allocated to industrial use, on which conservation priority species occur, particularly *Chaetacanthus* sp. nov.

Irrespective of the outcome of the proposed development, in terms of NEMA landowners have a duty of care towards the environment. It is suggested that the Ethekewini Municipality engage with the current owner of the site to ensure that better care occurs, by preventing the grazing that seems to have greatly increased on the land, originating from the neighbouring settlement, sand-mining that appears to be occurring on an uncontrolled and extensive basis and invasion by alien trees. If this does not occur, a considerable amount of the plant diversity will be lost from the site over time.

Should you have any queries, please do not hesitate to contact me through details above.

Yours sincerely

A handwritten signature in dark ink, appearing to be 'D Styles', with a large, stylized 'D' and a horizontal line extending to the right.

David Styles

## References

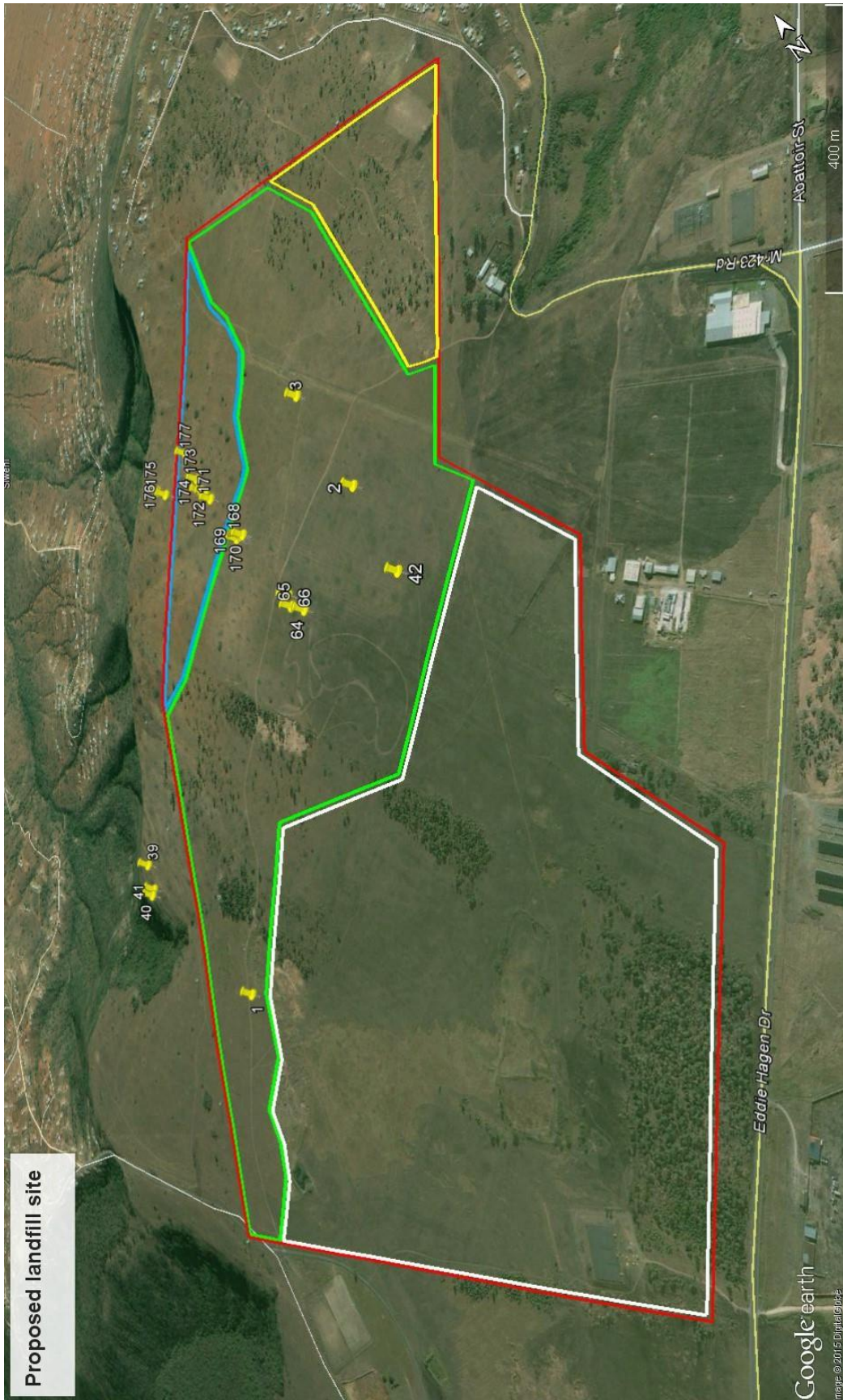
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Raimondo, D.; Von Staden, L.; Foden, W.; Victor, J.E.; Helme, N. A.; Turner, R. C.; Kamundi, D. A. & Manyama, P. A. (eds) 2009. Red list of South African plants. *Strelitzia* 25. South African National Biodiversity Institute, Pretoria.

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APPENDIX 1.1. Vegetation map



## KEY

**Red polygon** = Site outline

**Blue polygon** = Approximate area of rockier grassland, good to intermediate condition

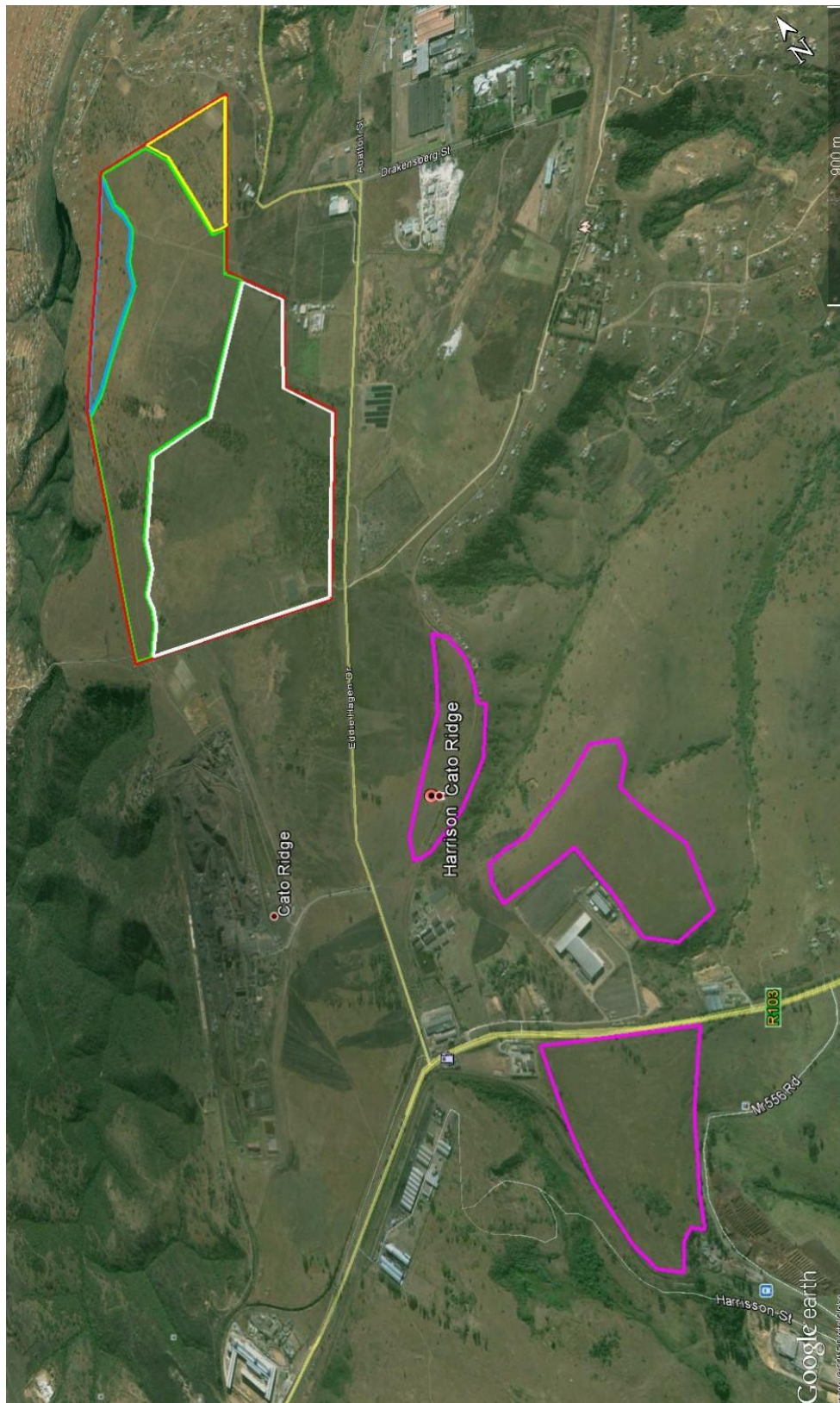
**Green polygon** = Approximate area of sandy grassland, mostly intermediate condition

**Yellow polygon** = Degraded grassland invaded by Eucalypts, but retaining some herbaceous diversity in parts

**White polygon** = Approximate area of secondary grassland



**APPENDIX 1.2.** The proposed landfill site showing the position of other proximate grassland in good condition (polygons in pink) that host *Chaetacanthus* sp. nov., together with red listed species. Most of this grassland is proposed for industrial use in the Cato Ridge LAP.



**Appendix 2.** 30 most abundant taxa in grassland on the site and immediately adjacent

<b>Eastern Plots (no sandstone exposure, sandy soil, much seasonally damp)</b>	<b>Abundance %</b>	<b>Western Plots (sandstone exposures with sandy soil between)</b>	<b>Abundance %</b>
<i>Chamaecrista plumosa</i> E.Mey. var. <i>plumosa</i>	15.05	<i>Justicia protracta</i> (Nees) T.Anderson subsp. <i>protracta</i>	10.09
<i>Zornia capensis</i> Pers. subsp. <i>capensis</i>	11.62	<i>Commelina africana</i> L.	10.09
<i>Commelina africana</i> L.	7.43	<i>Eriosema salignum</i> E.Mey.	5.79
<i>Vigna unguiculata</i> (L.) Walp.	6.48	<i>Cyanotis speciosa</i> (L.f.) Hassk.	5.58
<i>Selago densiflora</i> Rolfe	5.90	<i>Indigofera williamsonii</i> (Harv.) N.E.Br.	5.36
<i>Lotononis solitudinis</i> Duemmer	3.62	<i>Tetraselago natalensis</i> (Rolfe) Junell	4.94
<i>Wahlenbergia denticulata</i> (Burch.) A.DC.	3.62	<i>Chaetacanthus</i> sp. nov. = D.G.A. Styles 3822, 3919, 3950, 3972, 3973 (NH)	4.08
<i>Macrotyloma maranguense</i> (Taub.) Verdc.	3.24	<i>Abrus laevigatus</i> E.Mey.	2.79
<i>Anthospermum rigidum</i> Eckl. & Zeyh. subsp. <i>pumilum</i> (Sond.) Puff	3.05	<i>Euphorbia gueinzii</i> (Pax) N.E.Br.	2.79
<i>Cyanotis speciosa</i> (L.f.) Hassk.	2.48	<i>Brachystelma pulchellum</i> (Harv.) Schltr.	2.58
<i>Gnidia nodiflora</i> Meisn.	2.29	<i>Wahlenbergia madagascariensis</i> A.DC.	2.36
<i>Helichrysum asperum</i> (Thunb.) Hilliard & Burt var. <i>comosum</i> (Sch.Bip.) Hilliard	2.29	<i>Helichrysum asperum</i> (Thunb.) Hilliard & Burt var. <i>comosum</i> (Sch.Bip.) Hilliard	2.15
<i>Aeschynomene micrantha</i> DC.	1.90	<i>Pentania prunelloides</i> (Klotzsch ex Eckl. & Zeyh.) Walp	2.15
<i>Helichrysum longifolium</i> DC.	1.71	<i>Pachystigma venosum</i> Hochst.	1.93
<i>Hibiscus aethiopicus</i> L. var. <i>ovatus</i> Harv.	1.71	<i>Zornia capensis</i> Pers. subsp. <i>capensis</i>	1.93
<i>Kohautia virgata</i> (Willd.) Bremek.	1.71	<i>Ledebourea ovatifolia</i> (Baker) Jessop	1.50
<i>Eriosema salignum</i> E.Mey.	1.52	<i>Anthospermum rigidum</i> Eckl. & Zeyh. subsp. <i>pumilum</i> (Sond.) Puff	1.29
<i>Indigofera vicioides</i> Jaub. & Spach var. <i>rogersii</i> (R.E.Fr.) J.B.Gillet	1.52	<i>Delosperma lineare</i> L.Bolus	1.29
<i>Agathisanthemum chlorophyllum</i> (Hochst.) Bremek. var. <i>chlorophyllum</i>	1.33	<i>Dicoma anomala</i> Sond. subsp. <i>cirsioides</i> Harv.	1.29
<i>Striga bilabiata</i> (Thunb.) Kuntze subsp. <i>bilabiata</i>	1.33	<i>Tephrosia longipes</i> Meisn. subsp. <i>longipes</i>	1.29
<i>Hypoxis filiformis</i> baker	1.14	<i>Commelina modesta</i> Oberm.	1.07
<i>Lobelia flaccida</i> (Presl) A.DC.	1.14	<i>Cyanotis robusta</i> Oberm.	1.07
<i>Delosperma lineare</i> L.Bolus	0.95	<i>Gnidia kraussiana</i> Meisn. var. <i>kraussiana</i>	1.07
<i>Senecio glaberrimus-latifolius</i>	0.95	<i>Helichrysum caespitium</i> (DC.) Harv.	1.07
<i>Spermacoce natalensis</i> Hochst.	0.95	<i>Jatropha hirsuta</i> Hochst. var. <i>hirsuta</i>	1.07

Polygala transvaalensis Chodat var. transvaalensis Paiva	0.95	Kohautia virgata (Willd.) Bremek.	1.07
Richardia brasiliensis Gomes	0.95	Richardia brasiliensis Gomes	1.07
Crassula lanceolata (Eckl. & Zeyh.) Endl. ex Walp. subsp. transvaalensis (Kuntze) Toelken	0.76	Chamaecrista plumosa E.Mey. var. plumosa	0.86
Helichrysum rugulosum Less.	0.76	Crassula lanceolata (Eckl. & Zeyh.) Endl. ex Walp. subsp. transvaalensis (Kuntze) Toelken	0.86



### APPENDIX 3: Photographs



**Top:** Sandy grassland as occurs on most of the site, especially the eastern side. The flat-topped feature in the distant background is Table Mountain, north-east of Pietermaritzburg.

**Below:** Rocky grassland on the eastern edge of the site and beyond, with Natal Group sandstone outcrops conspicuous. Drought conditions now mean there is very little grow-through of herbaceous plants, and combined with grazing there is little grass replacement.







**Top:** Numbers of cattle are sequestered or ranged on the site, belonging to individuals in settlement off site. The increasing numbers have caused and will cause increasing degradation in future, if this pressure is not ended or curtailed.

**Below:** Sand-mining on the site, which appears to be occurring without control and on an unauthorized basis on part of the site, is also decreasing the amount of grassland.







***Biogeographically interesting, range restricted or red listed species on the site.***

**Top left:** *Agathisanthemum chlorophyllum* var. *chlorophyllum*.

**Top right:** The near Durban escarpment endemic *Aloe parviflora*, one of the smallest of all aloes.

**Middle left:** *Boophone disticha* (Declining) is scattered sparsely but widely on the site.

**Bottom left:** The diminutive *Brachystelma pulchellum* (Near Threatened), photographed on the western edge of the site, is nearly endemic to the Durban escarpment.





**Top:** *Chaetacanthus* sp. nov., an undescribed possibly local endemic, just growing out.



**Middle:** As *Chaetacanthus* sp. nov. grows out the stems elongate and become prostrate, often rooting where in contact with earth. The species is confined to sandstone pavements or sandy soil between rocks.



**Bottom:** The large flowers of *Chaetacanthus* sp. nov. compared to the much smaller flowers of *Chaetacanthus burchellii*, a common and widespread species that also grows on the site, in deeper soils usually away from rock outcrops.





**Top:** *Delosperma suttoniae*.



**Left:** *Eriosemopsis subanisophylla* (Vulnerable), photographed next to the site, but which occurs within its western edge.





**Top:** *Helichrysum asperum* var. *comosum*, an interesting biogeographical record as plants are usually found on sand dunes close to the sea.



**Left:** *Senecio albanopsis*, endemic or nearly-endemic to the Pondoland Centre and the Natal Group sandstone escarpment to the north, photographed at Craiglia about 2 km of the site, but with numbers of plants on the western edge of the site and just beyond.





**Top:** Senecio albanopsis flowers.



**Middle:** Pachycarpus coronarius, photographed on the western edge of the site. Cato Ridge is the only locality from which apparently known north of Pondoland, and also the only locality known in the Ethekewini Municipal Area, with the largest number on or next to the site.



**Bottom:** Close-up of Pachycarpus coronarius flower.



**Above:** The Critically Endangered, very localized endemic *Senecio exuberans* occurs in small numbers on the site, mainly but not only in the western part.

**Below:** *Pachycarpus* sp. nov., allied to *P. dealbatus*, (Dr. Ashley Nicholas, pers. comm.) which grows within 1 km of the site, a population since exterminated by grazing. This taxon is possibly a very rare local endemic. More plants could still occur in the area.







**Top:** S-shaped corona of *Pachycarpus* sp. nov.



**Middle:** Black-winged Lapwing nest on the site, of which there are a number in good rainfall years.

**Below:** Black-winged Lapwing photographed on the site, on which at least three pairs have been seen breeding before, but there are possibly more.

