Ecological Management Services

ECOLOGICAL SURVEY FOR THE PROPOSED WRENCHVILLE EXTENSION

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1. INTRODUCTION & TERMS OF REFERENCE

Ecological Management Services was contracted by Thandu Ntintili of Kalara Trading to undertake a specialist baseline ecological survey, required as part of a basic impact assessment for the planned expansion of the Wrenchville Township, Kuruman in the Northern Cape. The area will be developed as a Residential area zone 1.

This report presents the findings of the ecological specialist survey conducted on the property.

The ecological specialist survey included;

- a desktop and field investigation to identify and map different habitats in the proposed project area;
- identification of species to each habitat on the basis of fieldwork, professional experience and available research.
- The ranking of each habitat type based on conservation importance and ecological sensitivity;
- Identification of potential impacts on the ecology.

1.1. DETAILS OF SPECIALIST

Dr Natalie Birch

Qualifications:	BSc (Hons) Wildlife Management, Pretoria University PhD Botany (Rhodes University)
Dissertation:	Vegetation potential of natural rangelands in the mid Fish River Valley. Towards a sustainable and acceptable management system.
Research Interests:	My academic interests cover various areas dealing with ecological functioning, and wildlife management, with a special interest in the functioning and management of arid and semi arid rangelands.
Awards:	Grassland Society of Southern Africa award for: Outstanding research in Range and Forage Science (2001).
Associations:	Grassland Society of Southern Africa South African Council for Natural Scientific Professions

Declaration:

I Natalie Birch declare that I –

- act as the independent specialist in this study;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010
- have and will not have any vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2010;
- will provide the competent authority with access to all information at my disposal regarding the study.

1.2. THE STUDY AREA

The proposed development is intended to take place to the north east of the Wrenchville Township, on currently undeveloped land. The development area falls within the Ga-Segonyana Municipality.

Figure 1.1: Area of planned development (shown by red rectangle) in relation to Wrenchville Wrenchville Township, Kuruman.

The study area falls within the Ae landtype (a land-type being an area that is uniform with respect to terrain form, soil patterns and climate).

The soils within the Ae landtype are AC soils, which are red-yellow well drained soils lacking a strong texture contrast, with a high base status. They are eutrophic soils which are >300 mm deep with < 15% clay and no dunes.

The terrain consists of level plains with some relief. There is a small non perennial water course that runs along the southern boundary of the development area.

2. METHODS

Flora

The fieldwork component of this survey was conducted during October 2013. Aerial photographs & Satellite images were used to identify homogenous vegetation/habitat units within the proposed development area. These were then sampled on the ground with the aid of a GSP to navigate in order to characterise the species composition. The following quantitative data was collected:

- species composition,
- cover estimation of each species according to the Braun-Blanquet scale,
- vegetation height,
- amount of bare soil and rock cover,
- slope, aspect
- presence of biotic disturbances, e.g. grazing, animal burrows, etc.

Additional checklists of plant species were compiled by traversing a linear route and recording species as they were encountered.

Due to the brief duration of the survey and the lack of seasonal coverage, the species list obtained for the area cannot be regarded as comprehensive, but is nevertheless likely to include the majority of the dominant and common species present. To augment this data, the checklist of plant species for the study area was supplemented by including all species present in the National Herbarium PRECIS database that have been historically recorded in the 1:50 000 grids within the study area.

Searches were undertaken specifically for Red List plant species for the area including the current study area. Historical occurrences of Red List plant species were obtained from the South African National Biodiversity Institute for the quarter degree squares that includes the study area.

Fauna

The faunal study was undertaken as a desktop / literature survey combined with a field survey. The tasks included in each are given below.

Desktop/literature survey:

A desktop survey was undertaken to determine the red data reptile, amphibian, mammalian and bird species occurring in the quarter degree square 2723AD in which the proposed development areas falls. The likelihood of red data species occurring on-site has been determined using the i) distribution maps in the red data reference books and ii) a comparison of the habitat described from the field survey.

Field survey:

The fieldwork component of this survey was conducted during October 2013. The habitats on-site were assessed to compare with habitat requirements of red data species determined during the literature survey. During the site visit the presence and identification of bird and mammal species was determined using the following methods / techniques:

- Identification by visual observation.
- Identification of bird and mammal calls.
- Identification of spoor.
- Identification of faeces.
- Presence of burrows and / or nests.

3. VEGETATION

The area falls within Kuruman Thornveld, (Mucina & Rutherford 2006). The Kuruman Thornveld occurs on flat rocky plains, where it forms a closed shrub layer and a well developed open tree stratum consisting of *Acacia erioloba*.

3.1. PLANT COMMUNITY DESCRIPTION

The vegetation within the area is quite homogenous and is comprised of a mixed *Acacia* Savannah. Separation within the landscape is evident with respect to the density of the tree and shrub layer as the slope angle increases.

Open *Acacia* Savannah

Most of the study area is covered by an open savannah which consists of a tree and shrub layer comprised of species such as *Acacia karroo, Acacia hereroensis Acacia mellifera Acacia erioloba*, *Ziziphus mucronata* and *Tarchonanthus camphoratus.* Common graminoids included, *Andropogon schirensis Aristida meridionalis, Aristida stipitata, Eragrostis lehmanniana, Eragrostis echinochloridea, stipagrostis uniplumis*, and *Enneapogon cenchroides.* The grasslayer was patchy and mostly very closely cropped Other species recorded included *Geigeria ornativa, Sarcostemma viminale, Helichrysum zeyheri, Senna italica, Chrysocoma ciliata,* and *Leucas capensis*

Plate 3.1: Open savannah found within the proposed development area.

Mixed *Acacia* woodland

Where the slope angle increases towards the non-perennial water course at the southern section of the proposed development site, the density of the tree and shrub layer increases significantly to form a dense woodland. This area and the open savannah have a low beta diversity, however of significance is the absence of *Acacia erioloba* within this section where the slope angle is high. Prominent species within the tree and shrub layer include*, Acacia karroo, Acacia hereroensis, Acacia mellifera, Searsia lancea*, *Ziziphus mucronata* and *Tarchonanthus camphoratus.* Other species noted to occur within this vegetation section included, *Indigofera sessilifolia, Crotalaria spartiodes, Rhynchosia spp, Eriospermum corymbosum, Cucumis africanus, Asparagus suaveolens, Ursinia nana, Pteronia mucronata, Brachiaria marlothii, Cynodon dactylon, Cenchrus ciliaris, Chloris virgate, Enneapogon cenchroides, Enneapogon desvauxii* and *Aristida adscensionis*

Plate 3.2: The dense woodland found on the southern section of the site

Plate 3.3: Non-perennial water course

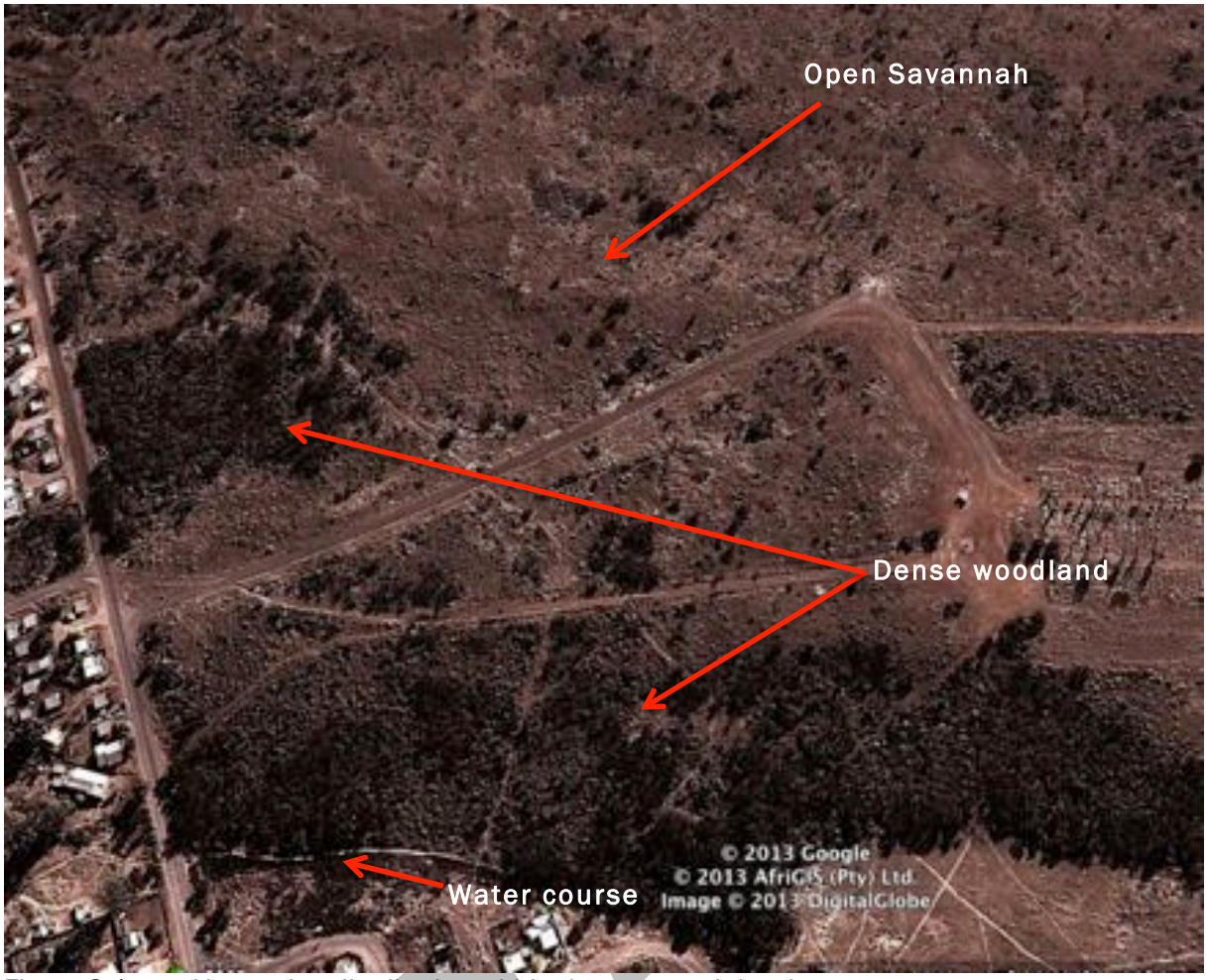

Figure 3.1: Vegetation distribution within the proposed development area

3.2. POPULATIONS OF SENSITIVE AND/OR THREATENED PLANT SPECIES

A number of threatened plant species have been recorded within the quarter degree grid 2723AD and were activity searched for on site. These are listed in the table below.

Species	Status	Habitat	Presence on site
Acacia erioloba E.Mey.	declining	Savannah, semi-desert and desert areas with deep, sandy soils and along drainage lines in very arid areas	Presence confirmed on site
Boophone disticha (L.f.) Herb.	declining	Occurs in dry or rocky grassland, on mountain slopes, in light scrub, and on stony hillsides.	Not found within study area These plants are used in traditional medicine and in such an urban environment it is unlikely that specimens remain on site
Cleome conrathii Burtt Davy	NT	Open to closed woodland - grassy open patches	Not found within study area, herbarium recordings list sites that have been disturbed, usually recorded after a burn last record in

			QDS is 1886
Drimia sanguinea (Schinz) Jessop	NT	Open veld and scrubby woodland in a variety of soil types	Not found on site although suitable habitat is found on site.

Table 3.1: Species of conservation concern identified as occurring in the quarter degree square

The tree species that occurs in the area that is protected in terms of the National Forests Act of 1998 (Act 84 of 1998) is *Acacia erioloba*. In order to remove protected trees an application must be submitted to DAFF and a permit obtained from DAFF prior to any removal.

Plate 3.4: Examples of the *Acacia erioloba* trees present on site

No plants that are listed as Endemic to South Africa were recorded on site. There were however a number of species that are listed in Schedule 2 of the Northern Cape Nature Conservation Act (Act (of 2009) and would require a permit from the department of Environment and Nature Conservation before they can be removed from site (these are listed in Appendix 1).

The study area falls within the Griqualand West Centre of Endemism (GWC) (Van Wyk & Smith, 2001). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics. Centres of endemism are important because it is these areas, which if conserved, would safeguard the greatest number of plant species. They are extremely vulnerable; relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range-restricted species. The GWC is one of the 84 African centres of

endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The GWC is considered a priority in the Northern Cape, as the number of threats to the area is increasing rapidly and it has been little researched and is poorly understood. Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority.

3.3. ALIEN/INVASIVE SPECIES

Alien/invasive species are controlled in terms of Regulation 15 and Regulation 16 (R. 280 of 2001) of the Conservation of Agricultural Resources Act (No. 43 of 1993). Regulation 15 divides the plants into three categories as indicated below:

Category 1: Plants that must be removed and destroyed immediately.
These plants serve no economic purpose and possess characteristics that are harmful to humans, animals and the environment.

Category 2: Plants that may only be grown under controlled conditions.
These plants have certain useful qualities and are allowed in demarcated areas. In other areas they must be eradicated and controlled.

Category 3: Plants that may no longer be planted. Mostly ornamental plants. These are alien plants that have escaped from or are growing in gardens, but are proven to be invaders. No further planting is allowed. Existing plants may remain (except those within the flood line, 30 m from a watercourse or in a wetland) and must be prevented from spreading

Alien and alien invasive species recorded in and around the property are listed in the table below:

Species	Category
Agave americana	Not declared
Arundo donax	1
Echinopsis spachiana	1
*Melia azedarach (*Syringa*)*	3
Opuntia imbricata	1
Opuntia ficus-indica	1
Bidens pilosa	Not declared

3.4. AREAS OF DISTURBANCE

The study area was typical of derelict land between developed areas, many foot paths were evident and a lot of litter was scattered around the property. In some areas the grass layer has been completely removed. The area is being used as communal grazing for goats and cattle. Patches of the site had also recently been burnt.

Plate 3.5: Some of the alien vegetation and goats recorded on site

4. TERRESTRIAL FAUNA

Very little evidence of wild faunal populations was evident on the property. The high amount of disturbance would have an impact on wild faunal populations. Disturbances that alter the natural environment have two effects, namely, it may cause the loss of certain species due to the destruction of habitat. It may also cause the influx of species previously unable to colonise an area owing to lack of suitable habitat or because they have been excluded through competition.

It was not possible to compile a complete list of species present on the property during the field survey. Although some observations were made during the site visit , emphasis was placed rather on the habitat in order to determine potential occurrence of species.

4.1. POPULATIONS OF SENSITIVE AND/OR THREATENED FAUNAL SPECIES

4.1.1. Reptiles Species of Conservation Concern

No red data terrapin, tortoises, snakes or lizards were identified as occurring in the quarter degree square, based on the distribution maps available in the South African Red Data Book for reptiles (Branch, 1988) and The Southern African Reptile Conservation Assessment (SARCA). The conservation status was cross checked on the IUCN website to determine most recent status listing for these species

4.1.2. Amphibians of Conservation Concern

All amphibians identified as occurring in the quarter degree square are listed as Least concerned , based on the distribution maps available in the South African Red Data Book for amphibians (Minter *et al*., 2004) and the South African Frog Atlas project.

4.1.3. Birds of Conservation Concern

A list of all red data bird species occurring in the quarter degree square was extrapolated from the Red Data Book of Birds (Barnes, 2000) and the SIBIS database with the distribution being confirmed in Roberts – Birds of Southern Africa, 7th edition (Hockey *et al.*, 2005). Based on an evaluation of the habitat requirements for these red data species, the potential of these species occurring either on-site or within 500m of the property boundary is provided in Table 4.1 below.

Common name	Species Name	IUCN	NEMBA	Potential for occurrence
Black Stork	*Ciconia nigra*	NT	VU	Low
Lanner Falcon	*Falco biarmicus*	NT	NL	Moderate
Lesser Kestrel	*Falco naumanni*	VU	VU	Moderate
Kori Bustard	*Ardeotis kori*	VU	VU	Low

Ludwig's Bustard	*Neotis ludwigii*	VU	VU	Low
Lesser Flamingo	*Phoenicopterus minor*	NT	NL	None
Greater Flamingo	*Phoenicopterus ruber*	NT	NL	None
Secretarybird	*Sagittarius serpentarius*	NT	NL	Low
Tawny Eagle	*Aquila rapax*	VU	VU	Moderate
Martial Eagle	*Polemaetus bellicosus*	VU	VU	Moderate

Table 4.1: Bird species of conservation concern identified as occurring in the quarter degree square

4.1.4. Mammals of Conservation Concern

Owing to the high amount of disturbance on site and the location of the property it is highly unlikely that any mammals of conservation concern occur on site. However a list of all red data mammal species occurring in the quarter degree square was extrapolated from the Red Data Book for Mammals (EWT, 2004) and is listed in Table 4.2 below.

Common Name	Scientific Name	Status	Potential for occurrence on site
Dent's Horseshoe Bat	*Rhinolophus denti*	NT	Low
Honey badger	*Mellivora capensis*	NT	Low
Schreiber's long-fingered bat	*Miniopterus schreibersii*	NT	Low
South African Hedgehog	*Atelerix frontalis*	NT	Low

Table 4.2: Mammal species of conservation concern identified as occurring in the quarter degree square

5. SITE SENSITIVITY

5.1. SITE SENSITIVITY

The classification of areas into different sensitivity classes is based on information collected at various levels. This includes the national conservation status of the vegetation, the presence of species of special concern and the condition of the vegetation

The national conservation status of the Kuruman Thornveld is given as Least Threatened, however on a more local scale the different vegetation communities within the Kuruman Thornveld may have varying conservation values owing to species composition and structure.

Sensitivity of habitats and sites within the study area was assessed using a combination of criteria as follows:

	Criterion	Definition
1	Conservation status of untransformed habitats occurring in the study area	The extent of each vegetation type occurring within the study area that is conserved and/or transformed relative to a targeted amount required for conservation
2	Presence and number of Red Data species and other species of special concern	Presence or potential presence of Red Data species within habitats
3	Within-habitat species richness of flora and the between-habitat (beta) diversity of the site	Presence or potential presence of Red Data Species within habitats.
4	The type or nature of topography of the site, ie presence of ridges koppies etc	Steepness and/or nature of topography in the study area.
5	The type and nature of important ecological processes on site, especially hydrological processes, ie wetlands drainage lines etc.	Habitats and/or terrain features that represent ecological processes such as water-flow migration routes etc.

The first two of these criteria are the most commonly used criteria for assessing the conservation value of a site and also constitute the criterion most commonly employed to justify the conservation of a site.

The large amount of overgrazing, traffic (foot traffic and vehicle movement) as well as the constant dumping of waste within the proposed development area has had a significant effect on the ecology and ecosystem processes in the area. This will only worsen if the area is not cleaned up and properly managed.

The overall conservation value of this section of land is not considered to be particularly high given its currently degraded state and close proximity to developed land.

There is a water course that runs along the southern border of the proposed development site and this water course and its surrounding vegetation is considered to have a higher conservation value and thus a higher protection status.

6. DISCUSSION AND CONCLUSION

The transformation of undeveloped land to residential will result in impacts to the biodiversity of the area. These impacts are briefly discussed below

Loss of natural vegetation

The vegetation within the development footprint will be completely and permanently removed. This causes vegetation fragmentation and habitat disturbance in the landscape. This disturbance destroys primary vegetation. Owing to the overall degraded state of the area the significance of this impact is reduced, however the water course and the vegetation surrounding the water course (particularly where the slope angle is high) should be excluded from development to ensure the integrity of the water course is maintained.

Loss of Red data and/or protected floral species

The only species of conservation concern confirmed on site was the*, Acacia erioloba*. . A licence for the removal of these trees from site would have to be obtained prior to the removal of any of these trees. However the site layout plans should be adapted to incorporated as many of the *Acacia erioloba* trees as possible to avoid removing the trees. These trees grow into substantial trees and can offer shade and add to the aesthetics of the housing development and therefore should be a far as possible left *in situ.*

Fragmentation of habitat

Termite mounds, burrows, nests and vegetation on which small mammals, insects, amphibians and reptiles are heavily reliant will be destroyed during clearing activities causing the permanent displacement of these animals. Owing to the fact that the area already experiences a significant amount of disturbance the risk to disturbing the faunal population within the area is low

During the construction, vegetation will be cleared this has the effect of creating unnatural open space through the vegetation and the matrix of the landscape. Due to this cleared open space and loss of natural vegetation, some species that habitually seek out protective cover for movement across the landscape may be prevented from moving across this open space due to the fear of predation. For smaller species, it limits movement and restricts access to foraging sites. This results in reduced population density of prey species (invertebrates and/or smaller birds and/or smaller mammals and/or herpetofauna) which then reduces the food availability for predators (invertebrates and/or smaller birds and/or smaller mammals and/or herpetofauna). The area surrounding the proposed development site has already been disturbed and altered and the removal of more natural vegetation results in a cumulative impact which significantly increases the significance of habitat fragmentation.

Intentional/accidental killing of fauna

Smaller fauna will inevitably be killed during land clearing activities, as these activities will destroy their habitat. In addition to unintentional killing of fauna, some faunal species, particularly herpetofaunal species, are often intentionally killed as they are thought to be dangerous.

Anthropogenic disturbances

Anthropogenic disturbances include aspects such as the on-site waste generation, vibrations caused by earth moving equipment, and illumination of the residential area. These aspects will impact on invertebrate species more than any other faunal species. These anthropogenic disturbances impact on the way invertebrates forage. For example; some invertebrates use vibrations caused by their prey to locate and catch them. Vibrations caused by earth moving equipment will make this impossible.

Loss of RDB species

A few RBD faunal species have the potential to occur in the area and the loss of habitat could result in a reduction in number or loss of the species from the area, although these fauna are most likely only using the proposed development site for foraging increase in the loss of natural vegetation and habitat fragmentation results in a cumulative impact which significantly increases the magnitude of this potential impact.

Recommendations

Although most of the development is planned to occur within the areas of lower sensitivity, adequate buffer zones will have to be implemented in order to protect the areas of higher sensitivity namely the water course and surrounding vegetation. Containing the disturbance to the smallest footprint possible will aid in protecting the surrounding areas, thus the development area and the protected trees will have to be clearly marked and some form of barrier erected to ensure that accidental removals do not occur.

Although floristically the drainage line does not contain any significantly important species in terms of individual species of conservation concern, the significance of this drainage line should not be overlooked. It is advisable that a clean up campaign is instituted for the water course area and its immediate surrounds as part of the development, to improve the condition of this area.

7. REFERENCES

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APPENDIX 1 Floral Species check list

Family	*Species*	IUCN	NCNCA
ACANTHACEAE	*Barleria macrostegia Nees*	LC	
ACANTHACEAE	*Barleria media C.B.Clarke*	LC	
ACANTHACEAE	*Monechma divaricatum (Nees) C.B.Clarke*	LC	
ACANTHACEAE	*Monechma incanum (Nees) C.B.Clarke*	LC	
AIZOACEAE	*Plinthus sericeus Pax*	LC	Schedule 2
AMARANTHACEAE	*Achyranthes aspera L. var. aspera*	Not Evaluated	
AMARANTHACEAE	*Aerva leucura Moq.*	LC	
AMARANTHACEAE	*Amaranthus hybridus L. subsp. hybridus var. hybridus*	Not Evaluated	
AMARANTHACEAE	*Hermbstaedtia fleckii (Schinz) Baker & C.B.Clarke*	LC	
AMARANTHACEAE	*Sericorema remotiflora (Hook.f.) Lopr.*	LC	
ANACARDIACEAE	*Searsia lancea (L.f.) F.A.Barkley*	LC	
ANACARDIACEAE	*Searsia tridactyla (Burch.) Moffett*	LC	
APOCYNACEAE	*Sarcostemma viminale (L.) R.Br. subsp. viminale*	LC	Schedule 2
ASPARAGACEAE	*Asparagus laricinus Burch.*	LC	
ASPARAGACEAE	*Asparagus suaveolens Burch.*	LC	
ASPHODELACEAE	*Bulbine frutescens (L.) Willd.*	LC	Schedule 2
ASPHODELACEAE	*Trachyandra laxa (N.E.Br.) Oberm. var. laxa*	LC	Schedule 2
ASPLENIACEAE	*Asplenium cordatum (Thunb.) Sw.*	LC	
ASTERACEAE	*Bidens pilosa L.*	Not Evaluated	
ASTERACEAE	*Chrysocoma ciliata L.*	LC	
ASTERACEAE	*Cineraria vallis-pacis Dinter ex Merxm.*	LC	
ASTERACEAE	*Dimorphotheca cuneata (Thunb.) Less.*	LC	
ASTERACEAE	*Eriocephalus glandulosus M.A.N.Müll.*	LC	
ASTERACEAE	*Felicia filifolia (Vent.) Burtt Davy subsp. filifolia*	LC	
ASTERACEAE	*Felicia muricata (Thunb.) Nees subsp. cinerascens Grau*	LC	
ASTERACEAE	*Felicia muricata (Thunb.) Nees subsp. muricata*	LC	
ASTERACEAE	*Gazania krebsiana Less. subsp. arctotoides (Less.) Roessler*	LC	
ASTERACEAE	*Geigeria brevifolia (DC.) Harv.*	LC	
ASTERACEAE	*Geigeria filifolia Mattf.*	LC	
ASTERACEAE	*Geigeria ornativa O.Hoffm. subsp. ornativa*	LC	
ASTERACEAE	*Gnaphalium englerianum (O.Hoffm.) Hilliard & B.L.Burtt*	LC	
ASTERACEAE	*Helichrysum lineare DC.*	LC	
ASTERACEAE	*Helichrysum spiciforme DC.*	LC	
ASTERACEAE	*Helichrysum zeyheri Less.*	LC	
ASTERACEAE	*Osteospermum microphyllum DC.*	LC	
ASTERACEAE	*Osteospermum muricatum E.Mey. ex DC. subsp. muricatum*	LC	
ASTERACEAE	*Pentzia argentea Hutch.*	LC	
ASTERACEAE	*Pteronia glauca Thunb.*	LC	
ASTERACEAE	*Pteronia mucronata DC.*	LC	
ASTERACEAE	*Senecio consanguineus DC.*	LC	
ASTERACEAE	*Sonchus oleraceus L.*	Not Evaluated	

ASTERACEAE	*Tarchonanthus camphoratus L.*	LC	
ASTERACEAE	*Ursinia nana DC. subsp. nana*	LC	
ASTERACEAE	*Verbesina encelioides (Cav.) Benth. & Hook. var. encelioides*	Not Evaluated	
BIGNONIACEAE	*Rhigozum trichotomum Burch.*	LC	
BORAGINACEAE	*Anchusa riparia A.DC.*	LC	
BRASSICACEAE	*Brassica tournefortii Gouan*	Not Evaluated	
BUDDLEJACEAE	*Buddleja saligna Willd.*	LC	
CAMPANULACEAE	*Wahlenbergia androsacea A.DC.*	LC	
CELASTRACEAE	*Gymnosporia buxifolia (L.) Szyszyl.*	LC	Schedule 2
CHENOPODIACEAE	*Atriplex semibaccata R.Br. var. appendiculata Aellen*	LC	
CHENOPODIACEAE	*Chenopodium hederiforme (Murr) Aellen var. undulatum Aellen*	LC	
CHENOPODIACEAE	*Salsola rabieana I.Verd.*	LC	
CHENOPODIACEAE	*Salsola tuberculata (Moq.) Fenzl*	LC	
COMMELINACEAE	*Commelina africana L. var. barberae (C.B.Clarke) C.B.Clarke*	LC	
CONVOLVULACEAE	*Seddera suffruticosa (Schinz) Hallier f.*	LC	
CRASSULACEAE	*Kalanchoe lanceolata (Forssk.) Pers.*	LC	Schedule 2
CUCURBITACEAE	*Acanthosicyos naudinianus (Sond.) C.Jeffrey*	LC	
CUCURBITACEAE	*Cucumis africanus L.f.*	LC	
CUCURBITACEAE	*Kedrostis africana (L.) Cogn.*	LC	
CYPERACEAE	*Bulbostylis burchellii (Ficalho & Hiern) C.B.Clarke*	LC	
CYPERACEAE	*Cyperus margaritaceus Vahl var. margaritaceus*	LC	
CYPERACEAE	*Cyperus marlothii Boeckeler*	LC	
CYPERACEAE	*Kyllinga alba Nees*	LC	
EBENACEAE	*Diospyros austro-africana De Winter var. microphylla (Burch.) De Winter*	LC	
EBENACEAE	*Diospyros lycioides Desf. subsp. lycioides*	LC	
EBENACEAE	*Euclea crispa (Thunb.) Gürke subsp. ovata (Burch.) F.White*	LC	
EBENACEAE	*Euclea undulata Thunb.*	LC	
ERIOSPERMACEAE	*Eriospermum corymbosum Baker*	LC	
EUPHORBIACEAE	*Croton gratissimus Burch. var. gratissimus*	LC	
FABACEAE	*Acacia erioloba E.Mey.*	Declining	
FABACEAE	*Acacia hereroensis Engl.*	LC	
FABACEAE	*Acacia karroo Hayne*	LC	
FABACEAE	*Acacia mellifera (Vahl) Benth. subsp. detinens (Burch.) Brenan*	LC	
FABACEAE	*Elephantorrhiza elephantina (Burch.) Skeels*	LC	
FABACEAE	*Indigofera alternans DC. var. alternans*	LC	
FABACEAE	*Indigofera comosa N.E.Br.*	LC	
FABACEAE	*Indigofera sessilifolia DC.*	LC	
FABACEAE	*Indigofera vicioides Jaub. & Spach var. vicioides*	LC	
FABACEAE	*Lotononis crumanina Burch. ex Benth.*	LC	
FABACEAE	*Medicago laciniata (L.) Mill. var. laciniata*	Not Evaluated	
FABACEAE	*Melilotus albus Medik.*	Not Evaluated	
FABACEAE	*Rhynchosia confusa Burtt Davy*	Not Evaluated	
FABACEAE	*Rhynchosia venulosa (Hiern) K.Schum.*	Not Evaluated	
FABACEAE	*Senna italica Mill. subsp. arachoides (Burch.)*	LC	

	Lock		
FABACEAE	*Tephrosia burchellii Burtt Davy*	LC	
GERANIACEAE	*Pelargonium myrrhifolium (L.) L'Hér. var. myrrhifolium*	LC	
IRIDACEAE	*Moraea polystachya (Thunb.) Ker Gawl.*	LC	Schedule 2
JUNCACEAE	*Juncus rigidus Desf.*	LC	
LAMIACEAE	*Leucas capensis (Benth.) Engl.*	LC	
LAMIACEAE	*Salvia stenophylla Burch. ex Benth.*		
LAMIACEAE	*Stachys burchelliana Launert*	LC	
LOBELIACEAE	*Lobelia erinus L.*	LC	
MALPIGHIACEAE	*Triaspis hypericoides (DC.) Burch. subsp. hypericoides*	LC	
MALVACEAE	*Abutilon betschuanicum Ulbr.*		
MALVACEAE	*Abutilon dinteri Ulbr.*	LC	
MALVACEAE	*Abutilon rehmannii Baker f.*	LC	
OLEACEAE	*Olea europaea subsp. africana*	LC	
OXALIDACEAE	*Oxalis depressa*	LC	Schedule 2
POACEAE	*Andropogon schirensis*	LC	
POACEAE	*Aristida meridionalis*	LC	
POACEAE	*Aristida stipitata subsp. graciliflora*	LC	
POACEAE	*Cenchrus ciliaris*	LC	
POACEAE	*Chloris virgata*	LC	
POACEAE	*Cynodon dactylon*	LC	
POACEAE	*Eragrostis echinochloidea*	LC	
POACEAE	*Eragrostis lehmanniana var. lehmanniana*	LC	
POACEAE	*Enneapogon cenchroides*	LC	
POACEAE	*Melinis repens subsp. repens*	LC	
POACEAE	*Stipagrostis uniplumis var. uniplumis*	LC	
POACEAE	*Themeda triandra*	LC	
POACEAE	*Tragus berteronianus*	LC	
RHAMNACEAE	*Ziziphus mucronata subsp. mucronata*	LC	
SOLANACEAE	*Lycium cinereum*	LC	
SOLANACEAE	*Solanum capense*	LC	
THYMELAEACEAE	*Gnidia polycephala*	LC	
VERBENACEAE	*Lantana rugosa*	LC	
VISCACEAE	*Viscum rotundifolium*	LC	
ZYGOPHYLLACEAE	*Tribulus terrestris*	LC	