

MONTANA SPRUIT CHANNEL UPGRADE, GAUTENG.

Red Data Scan, Specialist Report

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Prepared for:

SSV Consulting Engineers and Project Managers

1040 Burnett Street
Hatfield
Pretoria
0083

Compiled by:

Strategic Environmental Focus (Pty) Ltd

PO Box 74785
Lynnwood Ridge
Pretoria
0040

Tel: +27 12 349 1307
Fax: +27 12 349 1229

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1. INTRODUCTION

Due to alterations to the river channel and damming activities upstream, the Montana Spruit has experienced flooding since the early 1990s at the Tsamma Road crossing and surrounding properties. The City of Tshwane Municipality now proposes the upgrade of the Montana Spruit channel to combat the flooding problem. As rivers, waterways and riparian areas are sensitive for biodiversity and hydrological functions, Strategic Environmental Focus (Pty) Ltd was appointed to undertake specialist studies along the Montana Spruit.

Riparian areas along wetlands and waterbodies offer sensitive habitat to Red Data plant species in Gauteng Province, and a Red Data floristic scan was therefore undertaken to establish if suitable habitat for Red Data species and/or Red Data species were present on site. This report provides the results of a two day site visit.

2. BACKGROUND AND TERMS OF REFERENCE

2.1 Study Terms of Reference

The terms of reference for the Red Data Scan were as follows;

- Assess the site and surrounds for Red Data plants species, focusing on *Stenostelma umbelluliferum*; and
- Report on the findings indicating the presence of Red Data plants or suitable habitat.

2.2 Study Location

The site, referred to as the study area is located on portions 28 to 42, 137 and 138 of Doornpoort 295 JR, Gauteng. This study area is situated within the urban boundary. It runs parallel to Breed Street with Tsamma Road passing through it (Figure 1).



Figure 1. Locality Map

2.3 Project Limitations

Certain limitations were experienced in the current study, and these are discussed in further detail below.

As Red Data species are often cryptic, being very small in size and only flowering for very short time periods, repetitive site visits in one season and repetitive visits annually across different seasons are more successful in recovering individuals on a site.

Some Red Data plants, and particularly *Stenostelma umbelluliferum*, grow from bulbs and as such a large part of their structure is underground. As a result, they may lie dormant for lengthy time periods until conditions are suitable for them to emerge. Suitable conditions are often created by disturbance events such as fire, heavy rainfall and soil movement, and site visits conducted after such disturbance events are more likely to recover plants. For example, two new populations of *Stenostelma umbelluliferum* were discovered after a grader cleared an area of land.

The dense vegetation layer on site and access restrictions to properties along the spruit limited the areas covered during the site visits.

3. BACKGROUND INFORMATION

Stenostelma umbelluliferum, previously known as *Schizoglossum umbelluliferum*, was reclassified after the discovery of two sub-populations at the foot of the Magaliesberg in the Montana area of Pretoria. The discovery enabled the re-assessment of the genetic position, neotypification and re-circumscription of the species.

Stenostelma umbelluliferum is recognised as a perennial geophytic herb which exudes milky latex from its leaves and stems when harvested. A large part of the plant occurs underground making its above ground parts difficult to see even when flowering. Literature lists different flowering times for the plant with GDACE (2006) listing its typical flowering period between September and April and Bester & Nicholas (2006) listing flowering times between August and May, peaking between October and January. Fruiting time is typically between September and May.

4. METHODOLOGY

Background research was conducted prior to visiting the site to become acquainted with the appearance and characteristics of the plant. Consultation with the senior Asclepiadoideae (plant family) specialist, S.P Bester, at the South African National Botanical Institute (SANBI) was undertaken. During this time, plant specimens were viewed, pictures were taken and relevant published literature was perused.

A site visit was then undertaken on the 29th March and 04th April 2008. Line transects of 100m in length were walked across the site in search of the plant *Stenostelma umbelluliferum*. During this time, notes were made on the conditions and suitable habitat for the plant on site.

5. RESULTS

No individuals of *Stenostelma umbelluliferum* were discovered during the site visit. However, suitable habitat for the plant was present along the riparian zone of the spruit channel. The riparian zone is characterised by rich black turf soils with evidence of calciferous nodules distributed throughout the site. This is a clear indication of typical black turf soil conditions. Bester & Nicholas (2006) report on two populations that have been located approximately 200m away from the site. Although the soil and habitat conditions within the present study area matched conditions at these two sites, Bester (2008) informed that previous sampling on several occasions along the Montana Spruit, and within the study area, had not recovered any individuals of *Stenostelma umbelluliferum*. Certain factors may affect the plant's distribution; these include a shift in geological structure and development within the riparian zone.

Van Wyk (pers comm., 2007) stated that bulbous plants sprout following a burning event and good rainfall. Communication with the residents of 35 Breed Street informed that the site was last burnt in August 2007, seven months prior to the site visit. As these plants all flower at the same time following a disturbance event, any specimens present within the study area would have flowered after the August burn event and would no longer be visible above ground during the March-April period.

Seven additional Red Data plants have been recorded within the quarter degree square of the study site. These plants, their flowering times and habitat requirements are listed in Table 1. No individuals were recorded on site; however suitable habitat was present on site for *Trachyandra erythorrhiza* and *Cucumis humifructus*.

Table 1. Red Listed plants recorded within the quarter degree square (2528CB)

Species Name	Conservation Status (GDACE, 2007)	Habitat (GDACE, 2007)	Habitat on site
<i>Aloe peglerae</i>	Endangered	Rocky places often on gravely quartzite, confirmed on Magaliesburg slopes	None
<i>Bowiea volubilis</i> subsp. <i>volubilis</i>	Vulnerable	Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest	None
<i>Ceropegia deciduas</i> subsp. <i>pretoriensis</i>	Vulnerable	Direst sunshine or shaded situations, rocky outcrops of quartzitic Magaliesberg mountain series, in pockets of soil among rocks in shade of shrubs and low trees, can be seen in twining around grass spikes	None
<i>Cucumis humifructus</i>	Vulnerable	Woodland and grassland on deep soil	Present
<i>Holothrix randii</i>	Near Threatened	Grassy slopes and rocky ledges	None
<i>Macledium pretoriense</i>	Extinct	Hillsides	None
<i>Trachyandra erythorrhiza</i>	Near Threatened	Marshy areas, grassland usually in black turf marshes	Present

Trachyandra erythorrhiza has been discovered in similar habitats within the grassland areas of Gauteng. No individuals were recorded during the survey, however, limitations prevented access to certain sections of the riparian zone, where this plant may be present during peak flowering times, i.e. from September to November (GDACE, 2007).

The plant *Cucumis humifructus*, also known as aardvark cucumber, has evolved intricately with the aardvark, and its pollination, reproduction and flowering are reliant on an aardvark presence. Aardvarks are very adaptable and widely distributed animals that occur throughout Southern Africa, in areas where the soil is not very compact and sufficient termites are present (Cillie, 2007). They are only absent from the dry west coast of South Africa and Namibia. As no indicators of aardvark droppings, spoor or burrows were observed on site, they are unlikely to occur. Furthermore these solitary animals would be excluded due to the altered and developed environment along the spruit, and the continuous anthropogenic influences on site. The *Cucumis humifructus* plant is therefore also unlikely to occur on site, and no individuals were recorded during sampling.

6. CONCLUSIONS & RECOMMENDATIONS

Stenostelma umbelluliferum was not recorded on site during the site visit and is not expected to occur within the study area. Previous sampling within the study area and along the Montana Spruit confirms this. However, as suitable habitat is present for *Stenostelma umbelluliferum* and *Trachyandra erythorrhiza* along the Montana Spruit, the following measures are recommended:

- An independent Environmental Control Officer (ECO) must be appointed to manage the restructuring activities. This ECO must be made aware of the suitable habitat on site for *Stenostelma umbelluliferum* and *Trachyandra erythorrhiza* and of their potential to exist on site. The ECO must then carefully monitor the site for these two species. If plants are discovered, positive identification must be made by an ecologist and the relevant authorities must be consulted for removal and protection of the plant.
- Adjacent natural sections of the site must remain undisturbed by the restructuring activities. This can be accomplished by clearly demarcating the study area with

wire fencing to prevent any activity spill over in terms of construction materials and workforce.

- Black turf soils are highly susceptible to erosion and careful management of soil piles is necessary to facilitate the rehabilitation process.

This report must be viewed in association with a previously compiled ecological report. The ecological report was prepared by Strategic Environmental Focus (Pty) Ltd for SSV Consulting Engineers and Project Managers in June 2006.

REFERENCES

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GLOSSARY

Red Data Species: A species that occurs on the IUCN list of declining species and is protected nationally and internationally by legislation. The presence of this species in an area warrants the conservation of that area.

GDACE: Gauteng Department of Agriculture, Conservation and Environment.

Asclepiadoideae: A former plant family now treated as a subfamily (subfamily Asclepiadoideae) in the Apocynaceae. They form a group of perennial herbs, twining shrubs, lianas, or rarely trees. They also contain a significant number of leafless stem succulents.