



A view of the Pretoria city centre from a Magaliesberg ridge at sunset.

Islands of nature in South Africa's capital city

TEXT BY ARNOLD W. FRISBY¹,
DR MIRANDA DEUTSCHLÄNDER²
AND PROF BRAAM VAN WYK¹
PHOTOS BY ARNOLD FRISBY

¹ DEPARTMENT OF PLANT
AND SOIL SCIENCES,
UNIVERSITY OF PRETORIA

² DEPARTMENT OF ENVIRONMENTAL
SCIENCE, UNISA

ANCIENT MOUNTAIN RANGE IN A MODERN CITY

The Magaliesberg mountain range is ancient, having formed well over two billion years ago. This makes it one of the oldest mountain ranges on our planet and significantly older than relatively recently formed mountain ranges such as the Himalayas. Part of this geological history is clearly preserved in the form of ripple-marked quartzite rocks that may sometimes be encountered when walking in various parts of the mountain range. These ripples, which were laid down under former marine conditions, are perfect reminders of the extreme age of the Magaliesberg and – in part – why the range is so special. Today the Magaliesberg is well known to many nature lovers, hikers, rock climbers and outdoor enthusiasts, due largely to its proximity to – and in parts surrounded by – South Africa's densely populated administrative capital city, Pretoria in Tshwane Metropolitan Municipality.

In addition to being aesthetically pleasing and picturesque, mountain ranges such as the Magaliesberg often serve as refuges to a variety of life, foremost among which are plants (based on species numbers). This is particularly apparent when walking in the eastern Magaliesberg, where the sets of low-rising ridges are now completely surrounded by a variety of densely populated suburbs, informal settlements and city blocks. Thus, these ridges now represent the only "islands" of undeveloped land for many kilometres.

Over a course of eleven months in 2013, the diversity of a Magaliesberg ridge located in the eastern part of the Magaliesberg was investigated to get a better understanding of how important this and other urban ridges

may be to various life forms which were once much more widespread and abundant in the region. Because of the integral role plants play in ecosystems, an emphasis was placed on determining the plant diversity of the ridge.

The ridge that was the subject of the study is 7.5 km long and attains a maximum height of 1,400 m above sea level, but only around 100 m higher than the surrounding low ground. It is bound by Steve Biko Road (Voortrekker Road) in the west and the N1 highway in the east. To the north and south, it is surrounded by various suburbs, including Waverley, Rietfontein, Wonderboom, Wonderboom South, Magalieskruin and Montana Park.

FLORA OF THE RIDGE

Over 730 plant specimens were collected and identified using the H.G.W.J. Schweikerdt Herbarium (PRU) at the University of Pretoria. The resulting species list consisted of 360 species – a surprisingly high number considering the ridge's setting in the middle of one of South Africa's largest cities! This number continues to increase as plant collections and identifications continue and is likely to number well over 400 species. The identified plants belong to 87 families with the Asteraceae (daisy family), Fabaceae (legume family) and the Poaceae (grass family) contributing most species. Around 10% of the species



A: Ripple-marked quartzite in the Magaliesberg.
B: *Xerophyta retinervis* in bloom overlooking some of Pretoria's central suburbs and city centre.
C: Fire sweeping across the ridge in August 2013.



present are alien to South Africa, including invasive species such as Jacaranda (*Jacaranda mimosifolia*), Lantana (*Lantana camara*), Syringa (*Melia azedarach*) and Prickly Pear (*Opuntia aurantiaca*). This is to be expected thanks to the inevitable disturbance occurring in parts of the ridge and its boundaries, often caused by the building of houses and other structures including water reservoirs since many alien invasive species are very good at colonising disturbed habitats. Some of the alien species are common garden plants which have managed to 'escape' onto the ridge, most likely through dispersal of seed by birds and wind. Despite the presence of some alien plants, the greater part of the ridge is in pristine condition.

Of the 360 plant species hitherto recorded on the ridge, some can be considered as special. A perfect example of this is the succulent *Delosperma gautengense*, listed as Vulnerable. This diminutive member of the vygie family (the Aizoaceae) is known from only two sub-populations, namely the Waverley sub-population (the area in which this study was conducted) and the Elardus Park sub-population. The entire population size is estimated to be between 6,000 to 6,800 mature individuals. The Elardus Park sub-population is expected to be extinct or near-extinct within the foreseeable future since it is under severe pressure through urbanisation, illegal collecting, and disease. The Waverly sub-population, although more stable, is threatened by various proposed

infrastructural developments, including a proposed pipeline and access road.

A number of other species are present in large numbers on the ridge, including the African Potato (*Hypoxis hemerocallidea*; Decreasing), Krans Brosplakkie (*Adromischus umbraticola*; Near Threatened), and the Gifbol (*Boophone disticha*; Decreasing), all of which are harvested for use as traditional medicine, a practice which is putting increasing strain on their survival.

Another group of noteworthy plants found in abundance on the ridge are known collectively as the "pre-rain flowers" – species that flower before



D



E



F

D: Rock Scorpion (*Hadogenes* sp.).

E: Horned Adder (*Bitis caudalis*).

F: The Ink Plant, also known as the Blotting Paper Flower (*Cynium adonense*).

the summer rains fall and usually only if winter fires have occurred. The timing of their flowering has possibly evolved as a strategy to maximise pollination opportunities before the tall-growing grasses obscure flowers to potential pollinators. Two eye-catching examples include the Ink Plant (*Cycnium adonense*) with white flowers that turn dark black when bruised, and the very beautiful *Cyrtanthus contractus* – known as the Fire Lily because of its mass-flowering displays following fire. This attractive geophyte is widespread in the eastern parts of South Africa but is, however, relatively uncommon in Gauteng. This ridge represents one of only a few large populations of this species in the province and the species was described based on specimens first collected on this ridge.

A strong pattern of localised plant distributions was detected on the ridge, with many species restricted to one of its aspects. This uneven distribution of species on the ridge made it possible to delimit plant communities using plots and abundance measures.

In total four plant communities were identified and named based on the dominant herbaceous and woody species of each. The four plant communities identified are the following:



Community 1: *Senegalia (Acacia) caffra* – *Celtis africana* southern woodland.



Community 2: *Bewsia biflora* – *Hypoxis rigidula* southern lower grassland.



G: The dainty African Potato (*Hypoxis hemerocallidea*).

H: Another member of the Amaryllidaceae, the Fire Lily (*Cyrtanthus contractus*).



The presence of these different plant communities can be ascribed to the variation in climate as well as soil type and depth across the aspects of the ridge. As an example, the north-facing aspects are rocky with little or no soil and are also hotter and drier than the south-facing aspects due to more incoming solar radiation on the former. The result is that only certain plant species – that are adapted to these hot, dry and rocky habitats with shallow soils – can survive there, giving rise to a distinct plant community on the ridge's northern slopes.

FAUNA OF THE RIDGE

While exploring the ridge in search of plants, it became apparent that many animals that were presumably much more abundant in the Pretoria region in the past have found a refuge in this island habitat. The presence of a diverse array of animals on the ridge is a testament to its botanical diversity, as it is the plants that provide the resources needed to maintain complex food webs. Countless invertebrates exist on the study site, including hundreds (if not thousands) of insects and various species of scorpion including *Hadogenes* spp., *Opisthophthalmus* spp., *Parabuthus* spp. and *Uroplectes* spp.

Numerous reptiles are also present on the site, including the Horned Adder (*Bitis caudalis*), which is a close relative of the infamous Puff Adder. It is highly prized in the destructive and illegal pet trade.

In addition, this ridge is a crucial hunting ground for the enigmatic Verraux's Eagle



Community 3: *Burkea africana* – *Strychnos pungens* northern woodland.



Community 4: *Aristida junciformis* – *Loudetia simplex* summit grassland.

(*Aquila verreauxii*). These eagles are an awe-inspiring sight when a hunting pair soars soundlessly over your head, often on the north-facing aspects of the ridge. The presence of these apex predators is a testament to the condition of this habitat.

Various larger mammals are also present, including Cape Porcupine (*Hystrix africaeaustralis*), Rock Dassie (*Procavia capensis*), Scrub Hare (*Lepus saxatilis*) and quite remarkably, Endangered Mountain Reedbuck (*Redunca fulvorufula*). These medium-sized antelope are very well camouflaged, have good eyesight, are wary and are very fast over rocks, a combination of characters which often means that the only sign of their nearby presence is their curious alarm call, a 'whistle' that could easily be mistaken for a bird. On luckier occasions one might catch a brief, distant glimpse.

PROTECTING THE RIDGE (AND THE GREATER MAGALIESBERG)

Ensuring that this part, and indeed the entire Magaliesberg range remain in a pristine state for the pleasure of future generations and survival of its plants and animals, certain steps must be followed, including the removal of particularly aggressive invasive species such as lantana (*Lantana camara*) and the use of controlled fires. Fire is an integral part of many ecosystems, the absence of which can lead to a number of problems such as bush encroachment and poor (or no) flowering of non-grass plants.

Aerial photographs of the western extreme of the ridge have revealed how the suppression of fire over many years, in this case in the neighbouring Wonderboom Nature Reserve, has led to the loss of grasslands which are home to a large number of plant species. However, if grasslands burn too often, species may also disappear, therefore, it is necessary that habitats such as this ridge burn at regular,



A rare sighting of Mountain Reedbuck (*Redunca fulvorufula*).

well-spaced intervals once every two to three years.

A FINAL THOUGHT

While exploring this ridge of the Magaliesberg, with its panoramic views of South Africa's capital city, it became apparent just how resilient nature is, surviving in much of its former splendour despite the surrounding and widespread destructive habitat transformation. It is somewhat comforting to know that nature can persist even in large cities. As more and more urban people are realising the importance of nature, places such as this ridge have a bright future and may even

instil a sense of pride in the city people in years to come as such islands of nature become more and more rare.

'Smart gardening' approaches such as the planting of locally indigenous trees and shrubs and drought-hardy local plants (e.g. succulents) may even start to bring more of the ridge plants and animals into our gardens and back into their former ranges, ultimately reintegrating humans back into nature – a concept that is somewhat utopian. Next time you drive past a rocky ridge in and around a large city like Pretoria, take a moment to think and appreciate how important these little islands of nature may be to our future on this planet.



Multi-purpose Aprons,
Plunter (soil blocker)
Watering Spouts,
Watering Spikes and
Gardeners Natural Skin
Care Range





Cell: +27 (0)79 898 3769
dupss@mweb.co.za
www.facebook.com/6degreeseast
www.6degreeseast.co.za

