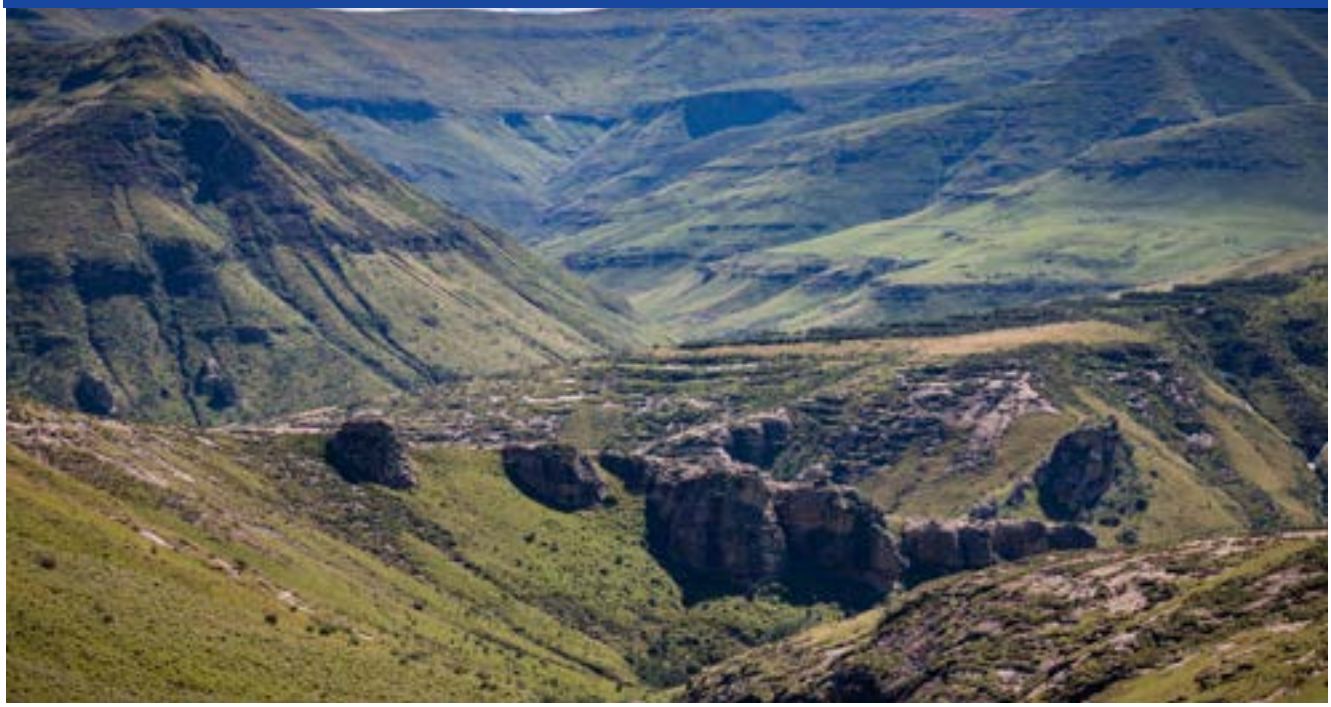
WATER AND THE ENVIRONMENT

New protection area offers valuable lifeline for South Africa's grasslands

A South African multi-stakeholder protected area sets an example for the conservation of a globally endangered biome. Article by Petro Kotzé.



Angus Burns

Grasslands are one of the most prolific habitats on Earth. Depending on the definition, they cover between 20% and 40% of the world's land area. Mostly because of its agricultural potential, the biome is also one of the fastest to have been converted. The tropical grasslands, savannas, and shrublands biome is now one of the planet's most endangered, while temperate grasslands are considered the most altered terrestrial biome on the planet.

The key to securing grasslands, and the knock-on benefits they provide, is the integration of agriculture and conservation in these biodiversity-rich landscapes, says Thembanani Nsibande, Manager of the Grasslands Programme at WWF South Africa. South Africa already has a long history of grassland conservation, practiced through a mix of formal protection, policy and collaboration with different landowners. The latest, and arguably most ambitious effort is taking place in collaboration between WWF, SANParks and other stakeholders, and entails the establishment of the 30 000-hectare Grasslands National Park in the mountains of the Eastern Cape close to the Lesotho border. The park will be established in a working agricultural landscape through voluntary stewardship agreements with both communal and private landowners.

When it was announced by SANParks in 2021, then-acting CEO, Dr Luthando Dziba, said that "the establishment of this national park will mark a new and innovative approach to protected area expansion."

Over and above the combination of different land uses,

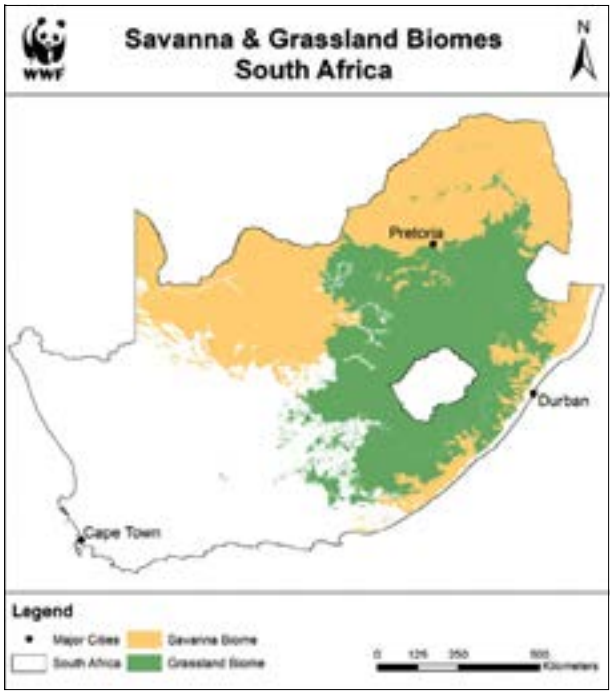
the new national park will contribute to the protection of one of a strategic water source area, which is an area that supplies a disproportionate amount of mean annual runoff to a geographical region of interest. While these areas cover about 10% of the country's land surface, they generate 50% of the country's water to support the economy, the people and agriculture. "They are regarded as our national assets," Nsibande says and, he adds, without healthy catchments these areas will be compromised with serious implications for water security. "Thus, healthy grasslands play a significant role as functional ecosystems providing clean water for many South Africans."

Yet, conserving these areas is challenging, involving multiple stakeholders and land owners with competing demands on the land. Nevertheless, good progress has been made and, Nsibande says, they anticipate that a notice of an intention to declare the protected area, initially around 10 000 hectares, will be published by the Minister of the Department of Forestry, Fisheries and the Environment in the first half of 2024. When so, the country will take one more step towards the conservation of one of our country's, and the planet's, most poorly protected terrestrial ecosystems.

A short overview of grasslands

Grasslands occur in almost all climatic zones except for the poles, extreme arid zones and the highest mountains. Fundamentally, a grassland consists of grasses and grass-like plants. Vegetation height varies from under 0.3 m to over 2.1 m, with roots extending 0.9 to 1.8 m deep into the soil. Grassland plants have evolved to cope with climatic extremes, specific soil conditions, fires and herbivory. These elements sustain the biome because they limit the establishment and dominance of woody vegetation.

Grasslands are commonly divided into temperate and tropical and subtropical grasslands. Temperate grasslands commonly don't have trees and large shrubs, like the Eurasian Steppe, central North American prairies and plains, the pampas lowlands of South America, the Patagonian Steppe and 'veldt' here in South Africa.



Source: WWF

Tropical and subtropical grasslands or, savannas, are scattered with trees and are found in Africa and Australia, but also the north of South America, the southern United States, South Asia and Southeast Asia.

In South Africa's nine official biomes, the Savanna (subtropical) and Grasslands biomes are split, with grasslands slightly smaller than savannahs, which is the country's largest. The Grassland Biome of South Africa, Lesotho and Swaziland covers an area of over 360 589 km^2 (28% of the land area) straddling the high central plateau of the highveld in South Africa, the mountainous areas of Lesotho, and the high-lying ground of the eastern seaboard (including the uplands of KwaZulu-Natal, Eastern Cape, and Mpumalanga).

Grasslands globally are some of the most species-rich habitats on Earth, including many endemic, rare and endangered ones. In the Southern Africa Grasslands Biome, the topography varies broadly, and ranges from flat to the highest mountain in southern Africa, Thabana Ntlenyana at 3 482 m above sea level. The biome includes four bioregions, namely the Drakensberg Grassland, the Sub-escarpment Grassland, the Dry Highveld Grassland and the Mesic Highveld Grassland, as well as three centres of plant endemism. These are the Drakensberg Alpine Centre, the Wolkberg Centre and the Midlands Putative Centre. Three more centres of plant endemism are shared with the Savanna Biome. These are Barberton, Sekhukhune and Soutpansberg Centres. The biome also includes three World Heritage Sites, namely the uKhahlamba Drakensberg; Cradle of Humankind and Vredefort Dome.

The habitats provide several integral functions to life on Earth. They are essential for climate mitigation, as they store carbon in their extensive root systems. They are often the source of, or support, many of the world's biggest rivers and wetlands. "Healthy grasslands act as a sponge and blanket for covering and protecting the soil, catching, and releasing clean freshwater into rivers and wetlands for the benefit of both upper catchment and downstream users," Nsibande says.

A biome rich for the pickings

The combination of underground biomass with moderate rainfall tends to make grassland soils very fertile and appealing for agricultural use. Major loss of natural grasslands due to their conversion to croplands started at the beginning of the 19th century, with the largest declines seen in the North American prairie (up to 99%), the pampas of South America, and steppes in Europe, middle Asia and in the Mediterranean region.

According to the WWF's 2023 ***Plowprint Report***, which analyses the rate of grassland plow-up across the US and Canadian portions of the Great Plains, close to 6 500 km^2 of grasslands were destroyed in 2021, contributing to a total of nearly 130 000 km^2 ploughed across the region since 2012. The Northern Great Plains region of the ecosystem, the report elaborates, is currently one of the world's last four intact temperate grasslands, and the annual area ploughed increased from 2020 to 2021.

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Strategic water resource areas make up only 10% of South Africa's land area, yet provide 50% of our water. Only 12% of these areas enjoy formal protection.

The report further states that there is still an opportunity to change course, because more than 1.5 million km^2 across the Great Plains remain in grass cover, managed by private landowners, native nations, and federal entities.

In the tropics, the loss of grassland has been lower compared with temperate grasslands (24% and 46% of area, respectively), but large areas of tropical grasslands are currently undergoing a wide agricultural expansion too.

In South Africa, Swaziland and Lesotho, the Grassland Biome has also been impacted by large-scale conversion. The biome supports both dense human populations and large-scale agricultural use. The primary drivers of agricultural transformation have been the dairy, wool, beef, maize, sorghum, wheat, and to a lesser extent, sunflower industries. A further 65% of the biome is grazed for livestock and game.

Large stretches of grassland have also been flooded for the construction of large dams and, as an extensive coal belt is located within it, conversion for mining and coal-fired power stations have also taken place. Gold mining is a further transformer of temperate grasslands.

Another threat to grasslands is woody encroachment, the increase in abundance of indigenous woody plants, such as shrubs and bushes, at the expense of herbaceous plants, grasses and forbs. This phenomenon can be driven by overgrazing, fire suppression, grassland abandonment, nitrogen pollution, and increased atmospheric CO_2.

Land-use change, followed by climate change and nitrogen deposition, have been predicted as major drivers of grassland loss in the near future.

Nsibande says the landscapes that they are working on are impacted by invasive alien vegetation, erosion due to poor land management practices such as overgrazing and overstocking, and uncontrolled fires which also contribute towards soil erosion. Particularly in the Grasslands Biome, both water quality and quantity are compromised because of loss of vegetation cover. This leaves the soil exposed and unprotected making it prone to erosion which leads to high silt load in rivers located in the lower-lying areas," Nsibande says.

Protection of grasslands

Regarding the establishment of the new national park, over and above limited funding for implementation and incompatible land use activities, one of the largest challenges to the project is to find willing landowners, Nsibande says. "The entire process is voluntary and purely dependent on landowner willingness." Ultimately, Nsibande explains they aim to increase South Africa's level of protection for the Grassland Biome from 3% to 15% at the very minimum so, success for them would be seeing more landowners buying into the project objectives.

Just recently, WWF announced that the 4 400-hectare Balloch Protected Area would potentially be enlarged with a further 7 000 hectares of either Protected Areas or nature reserves, as the owners of the properties Avoca, Glencoe and Reedsdell committed their land to stewardship agreements through arrangements with Eastern Cape Parks and Tourism Agency (ECPTA) and partners. Notices for intention to declare were published in the Eastern Cape's provincial gazette earlier this

year. The properties are close to the proposed new Grasslands National Park, in the poorly protected Southern Drakensberg's grasslands.

Another important step has been an external grasslands speciality-led biodiversity site assessments of approximately 30 properties, veld condition assessments on 29 properties, and three 'bioblitz' surveys across the landscape with support from SANBI CREW programme and partners in the landscape. These surveys are conducted to gain a clearer understanding of distribution patterns, species of conservation concern and the identification of endemic and range-restricted species. Veld condition and the general health of the rivers and wetlands in the area were also investigated.

The findings concluded that the high-altitude sites were still in relatively pristine condition and that the area offered a multitude of natural attractions, among them birds, floral diversity, geology, stargazing, and cultural heritage. Furthermore, this was said to hold great potential for training local guides from surrounding communities to meet the needs of the ecotourism market as the park project progresses.

In September last year, the assessments' findings were presented to the very first SANParks review panel, Nsibande says. The purpose of this was to determine the biodiversity merit of each assessed property to allow the review panel committee to recommend and agree on the protected area category that the property qualifies for. "This immensely important milestone is one of the key project achievements in paving a way forward for the declaration process, assessing the biodiversity merit of the properties where landowners have indicated a willingness to be included in the national park," he says.

The next step will be the signing of contractual agreements with participating landowners followed by the publication of a notice of intention to declare, and a 60-day public participation process.

Their ultimate is then the actual declaration of the national park and unlocking the incentives associated with its establishment, such as tax incentives and the financial benefits of agricultural produce with sustainability credentials.

Showcasing this unique national park would be a game changer in the way protected areas are established, and break the stereotype associated with the traditional way of doing so, Nsibande says. At the same time, it will strengthen the co-existence between conservation and sustainable agriculture through an inclusive and collaborative approach. "We would also like to see improved management and protection of the Grassland Biome and strategic water source areas for the benefit of both present and future generations, to allow for a healthy ecosystem where people and nature thrive."

References

- The conservation status of temperate grasslands in southern Africa, by C Carbutt, M Tau, A Stephens and B Escott, published by The Grasslands Society of Southern Africa in Grassroots, February 2011 | Vol 11 No.1
- Defining South Africa's Water Source Areas, by Prepared by: Jeanne Nel, Christine Colvin, David Le Maitre and Janis Smith, Imelda Haines
- Grassland biodiversity, by Jana S. Petermann, Oksana Y. Buzhdygan, published in Current Biology (Elsevier Date), 11 October 2021

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The area in the vicinity of Rhodes/Maclear in the Eastern Cape, where a national park is being created. The declaration of the national park status on private and communal land is voluntary, involving willing landowners and SANParks.

NATURAL CAPITAL

Greening the city: A framework for integrating natural capital into urban asset management systems

Like many countries, the increased urbanisation and industrialisation of South Africa have led to significant amounts of environmental degradation. This has made cities more vulnerable to multiple climatic crises, resulting in many seeking to adopt successful adaptation strategies. Unfortunately, still more follow unsustainable development pathways. Article by Kyle Harris.

Through extensive literature review, natural capital, such as wetlands, rivers and forests, have been recognised as having the potential to complement grey infrastructure while reducing the adverse effects of economic practices on societies and the environment. Several case studies have proved that a drop in property value follows degradation of the natural capital. Much like grey infrastructure, natural capital can be seen as an asset and delivery of ecosystem services can be described as the annual rent received from the asset. The presence or condition of ecosystems is similarly linked to the economics of associated built infrastructure. These conceptual similarities and linkages between natural capital and built infrastructure provide a valuable opportunity for exploring the integration of these natural assets into existing urban asset management.

Despite the increasing awareness of the importance of natural capital, few formal institutional arrangements, specifically economic policy instruments, exist that formalise and internalise decision-making around these assets into day-to-day economic decision-making. An ongoing Water Research Commission (WRC) funded project (**WRC project no. C2021/2022-00788**) is investigating a municipal asset management system as a specific economic policy instrument for the formal institutionalisation of urban or municipal water-related green infrastructure. The central hypothesis is that the structure of existing municipal asset management systems can accommodate natural capital, as defined by existing natural capital delineation systems. The project seeks to test the hypothesis at the hand of a case study, located within the City of Tshwane (CoT).

The Hartbeesspruit, which incorporates the Colbyn Valley Wetland, is an ideal urban river system for piloting this project for multiple reasons. Firstly, the Colbyn wetland system covers a wide area and is currently in fair condition, indicating that it has the capacity to provide key ecosystem services to residents of the CoT. Secondly, most of the riverine system is in close proximity to urban built-up areas and performs an important role in reducing erosion, regulating flow regimes and regulating nutrients and toxins at little to no operational or capital cost, a huge saving to the Metro. These are benefits that the residents of the CoT essentially receive for free and could be enhanced through the rehabilitation of this ecosystem.

To integrate natural capital into the asset management systems of the CoT, we propose the following framework:

- ***Asset delineation:*** The geographical boundaries of each natural capital component are delineated using desktop studies and ground truthing. Attribute data was collected for each wetland and mapped across the catchment. Attributes refer to the specific properties of an asset component, such as type, size, class, condition, location, and identity.
- ***Asset classification:*** The assets are then classified based on their function, asset type, or a combination of the two.
- ***Valuation of the asset:*** Valuation of the natural capital asset will be based on the financial benefits the municipality derives from the asset. This will be calculated using a cost-benefit analysis (CBA) where the cost of rehabilitation of the ecosystems by the CoT and the benefits to the residents and the CoT are calculated.
- ***Integration:*** Integration into the asset register: The asset is then integrated into the CoT's asset management system.

The integration of natural capital into the CoT's asset management systems presents an opportunity to transform our methods for creating sustainable and resilient urban landscapes. It also provides the chance for us to review practical means for linking ecological valuation studies with urban economies and asset planning structures. The successful implementation of the proposed framework will enable the city to benefit from the green ecosystem services offered by these assets more effectively, improve public health and well-being and mitigate the impacts of climate change, through adaptation and resilient systems.

Utilising this framework will also elevate the city's environmental credentials (i.e. making a case for the value of natural capital in mitigating urban degradation and resulting risks, trajectories of change, future loss of benefits and working towards Sustainable Development Goals, like 6, 13 and 15, in particular), changes that will likely attract more investors and foster economic growth. This framework emphasises the need for collaboration among various stakeholders, including local government authorities, citizen scientists, community groups, private sector entities, and environmental experts. Moreover, it highlights the importance of data-driven decision-making, long-term planning, and continuous monitoring and evaluation. As CoT takes decisive steps towards incorporating natural capital into its asset management strategies, it can pave the way for other municipalities to follow suit and build a greener, more sustainable future for generations to come.

There can be no successful business and healthy society on a sick environment. The images illustrate the need to maintain the natural capital as it would be to any asset.