

Grassland Conservation in Midrand: Managing our shrinking heritage

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The grassland biome covers about 30% of South Africa, and is economically one of the most important parts of the country. Most of South Africa's water is generated in the grassland biome, yet it remains one of the least protected and probably most misunderstood biomes in southern Africa.

Greater Johannesburg, the biggest urban area in the grassland biome, is developing rapidly, threatening to swallow up what few remnants of natural vegetation are left around the city. One area that is changing swiftly is Midrand, halfway between Johannesburg and Pretoria, where residential, commercial and industrial developments are rapidly gobbling up any available land. The Greater Kyalami Conservancy (GEKCO) is a small non-governmental organisation dedicated to trying to protect the portions of Kyalami that are still zoned as agricultural by lobbying policymakers and educating residents about the natural riches at their feet. The Grassland Society of Southern Africa (GSSA) and GEKCO combined forces to arrange a symposium on conserving grassland in Midrand, with the emphasis on practical suggestions for biodiversity management in a fragmented landscape.

Overview of the grassland biome and threats

Four speakers led the discussions with talks based on years of experience in their respective fields, with each subject being thoroughly debated by an audience consisting of people with a wide range of experience, from concerned housewives to retired engineers, to environmental consultants.

About forty people attended the talk, some from as far away as Ladysmith and Potchefstroom, and the majority from around Midrand.

Fire: the misunderstood element

Mike Panagos of Tshwane University of Technology started proceedings by giving an overview of the role and importance of fire in rangelands. Fire is seriously misunderstood by the general public and by policymakers, yet it remains one of the most crucial elements in rangeland ecology. Mike reminded the audience of the name given to southern Africa by early Portuguese explorers: "Terra dos fumos" – land of smoke. The South African grasslands are a fire-prone environment, adapted over millennia to frequent burns. Good reasons for burning are fairly well established by science – to remove moribund grass, to burn firebreaks, to control bush encroachment, to encourage animal movement. Other reasons for burning are questionable at best – to control ticks or to provide a "green bite" in winter.

The decision to burn should primarily be driven by the condition of the veld at the time, which includes considering the species composition and fuel load of the veld, as well as, of course, by the management objectives of the property. The practice of clearing firebreaks mechanically is widely practiced across South Africa, but is disastrous as it encourages soil erosion.

A great deal of the discussion centred around practical issues of burning in an area like Midrand which consists predominantly of small (1-2ha) plots surrounded by electric fences, and with a great deal of infrastructure per plot. Mowing was discussed as an alternative to burning, although several species do require fire to stimulate germination or growth. Mowing can replace burning to a certain extent, in removing the fuel load and keeping the structure of the grass sward short. Mowing in winter is far less destructive than mowing in summer, as most of the plants are dormant in winter.

Shallow wall with a palisade fence



Fences and Frogs

Vincent Carruthers, the renowned wildlife expert and author of numerous field guides to frogs and wildlife in general, followed with a wonderful and very practical talk on managing wildlife in a fragmented landscape. He started by differentiating between the “involved” school of wildlife management, which includes things such as putting out licks, feed or water for animals, and the “ecological” school of wildlife management, which focuses on managing the ecosystem and the surroundings and letting the animals look after themselves.

In the ecological school, habitats are conserved to provide foraging and breeding habitats and corridors for movement.

Vincent focussed on three broad Highveld habitat types: open grassland, wetlands and woodland, and for each habitat type gave the audience an idea of what species to expect and how to encourage wildlife in those habitats. For open grassland, structural diversity of the vegetation, in other words, a mixture of short and tall patches, can be very important for providing foraging areas and refuge areas for many species. Proper burning is crucial, which means burning at the right time of year, burning at the ap-

propriate frequency and setting the right type of fire. Ring-burns, for example, though practically very useful for managers, are devastating for wildlife as a ring-burn leaves no escape route for small animals.

Lawns, insecticides, dogs, cats, floodlights and fences are disastrous for wildlife. The discussion centred on a number of practical suggestions for balancing security and ecology. Floodlights can be shaded appropriately so that they light up the area of concern and not half the neighbourhood. Insecticide use can be minimised or eliminated entirely. Dogs and cats are a more difficult subject, since most people love their pets, although as predators they can be fatal to many species.

Fences can be made more porous to animals by building shallow “subways” at regular intervals along the fence. Vincent proposed a design which, he said, allowed animals but not humans to crawl through the fence. A concrete trough with walls at both ends and spikes mounted on the walls is placed under the fence at intervals of about thirty metres. Animals as large as steenbok are able to crawl through the tunnel so made, but the hole is far too small even for a child to crawl through.



Ordinary palisade fencing is reasonably friendly to smaller animals, but solid walls and electric fences are impenetrable, as are designs involving a shallow wall (about 30 cm) with a palisade fence on top. Many small animals such as frogs simply cannot mount the shallow wall.

In woodlands, animals can be encouraged firstly by minimising disturbance. Trees should form coppices with many different species at different heights, not regular plantations. Old logs and litter on the ground will provide habitat for an enormous variety of smaller creatures. Vincent strongly opposed “gardening” in woodland patches, as the regular disturbance would destroy habitat for small creatures and discourage many others. The most important management input, however, is managing alien invasives.

In managing wetland areas for wildlife it is crucial to recognise the total wetland, which includes seeps, flood lines and the margin of the wetland. Wetlands are defined by soil characteristics, and a patch of land can be part of a wetland even if it is apparently dry on the surface. Compacted banks and eutrophication can greatly discourage wetland wildlife.

Finally, Vincent ended off with the advice to ensure a habitat for oneself. Create a quite, peaceful and comfortable corner where one can relax and enjoy the nature that one has worked so hard to protect.

Keystone of South Africa's water production systems



Wetlands and People

John Dini, head of the Working for Wetlands programme, introduced the audience to one of South Africa's major ecological/poverty relief programmes. Working for Wetlands is a job-creation project founded solidly on the principle that wetlands are a keystone of South Africa's water production systems, and therefore critically important to the economy of a semi-arid country (a fact often forgotten by South Africans, since most of the population lives in the higher-rainfall fraction of the country).

Wetlands are not easy to define or to measure, especially for a layman. Their definition rests not so much on water as on soil, or more accurately, on the interaction of water and soil. A wetland could, in fact, be invisible to the untrained eye while the soil a

few inches below the observer's feet is seasonally or permanently saturated. However, the art of identifying wetlands does not require esoteric skills taught by secret societies exchanging coded handshakes – anyone can be taught to recognise the crucial signs that differentiate a wetland from the adjacent dryland, starting with the greyish colours of the soil.

Globally, half of historical wetlands are estimated to have been lost, while there is no estimate for South Africa. Working for Wetlands is in the process of compiling a national wetland database, which already consists of around 114 000 wetlands, covering 3.6% of the country's surface. Even this map, by John's own admission, is a long way from complete.

The major cause of wetland degradation is the perception, still widely prevalent, that wetlands are valueless wastelands that need to be “reclaimed” to be of use to society. Wetlands have been drained for agriculture or urban development, drowned under dams, eroded through poor road design or overgrazing, polluted by waste, or been afflicted by a hundred other curses of civilised society.

The result has been devastating for clean and reliable water production, flood control, and ecological functioning.

The Working for Wetlands programme was born out of the new recognition of the importance of wetlands to stable ecosystems and economic stability. Working for Wetlands spends R75 million annually repairing around 100 wetlands, creating 1 500 jobs a year.

A number of fundamentals for wetland management can be outlined, starting by maintaining the basic fabric of the wetland: water, soil and vegetation. In the case of water, minimise the impact of damming or draining, maintain diffuse flows across the surface of the wetland, and maintain the residence time of the water. The most important aspects of soil management can largely be summed up in two words: “curb erosion”. As well as erosion, soil extraction or compaction can destroy wetland functioning. Native vegetation cover needs to be managed by careful use of grazing and fire and management of invasive plants.

Interestingly, the good news is that wetlands are surprisingly resilient and can be relatively easily restored to a functioning ecosystem, with some fairly minor engineering interventions and wise management thereafter.

Several pieces of legislation protect wetlands, including the Conservation of Agricultural Resources Act, the National Environmental Management Act and the National Water Act. Lawyers will say that ignorance of the law is not an excuse for breaking it, so anyone who has a property with wetlands on

it should familiarise themselves with the relevant portions of the law before considering any activity that might affect the wetland. Working for Wetland's website would be a useful place to start looking for information.

Comfort and Conscience

Charlotte Smit from a company called InSynch Sustainable Technologies presented a fascinating talk on sustainable building, using a combination of 21st Century and ancient technology. Existing houses can be retrofitted with technologies such as solar water heaters and "grey water" systems which reuse the waste water from baths, showers and sinks for purposes that require only grey water (such as watering the garden). But the core of her talk and the most interesting was the building technology. Houses can be built off materials which have a far lower cost to the environment than standard building materials such as brick and concrete. More to the point, these "green" houses need not look like shacks in a backpackers' commune on a Thai island. Architects can design stunningly modern homes built with materials such as straw or adobe. The technology exists to make these homes comfortable, safe and attractive. More importantly, the building technology is approved by the local council in Midrand and many other municipalities.

A green home does not simply refer to a straw house or the fitting of a solar water heater. InSynch calls a green home one that embraces smart design, technology, construction and maintenance elements to lessen the impact of the home on the environment and improve the health of the people who live inside it. One of the simplest and cheapest examples is simply the orientation and layout of the house – a house that absorbs the sun in winter and is shaded from it in summer will have far lower energy costs for heating and cooling than one in which orientation is poorly considered. Anyone who has sat in a freezing living room in winter and baked in the same room in summer will appreciate how a few simple design elements could have improved that room's comfort. A shaded patio with creeping plants to cool it in summer can make a pleasant place to relax on a hot

summer's day without requiring an air-conditioner.

The essence of green building design is a holistic approach to the project, considering six design principles: Socio-economic (promoting social, economic and cultural upliftment), health, water efficiency, land (respectful of the local environment), and holism.

Green building is defined as a project with a low construction impact, resource efficient (considering the "cradle to grave" environmental cost of resources), long lasting, non toxic, practical and beautiful.

Charlotte described a range of actual designs that InSynch had worked on, including using grey water to create an artificial wetland to attract frogs and birds, or a swimming pool disguised as a wetland for the same reason (not using grey water!), as well as a number of houses built with materials such as rammed earth, adobe or straw bales. The possibilities are limited only by imagination.

The future

The symposium was a great success, due to the dedication of a passionate and knowledgeable group of speakers who gave up their Saturday morning to share their enthusiasm with others, and to an equally passionate group of delegates with a wide and fascinating range of skills and experiences to share. The remaining natural systems in the Midrand area are severely threatened by powerful forces of urban development, and the residents of the area and GEKCO will need a lot of help to fight off the waves of bulldozers waiting on the front line. The GSSA, with our network of real scientific expertise, can provide the contacts for much-needed back-up to small, local organisations like GEKCO.

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