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Grassroots

Newsletter of the Grassland Society of Southern Africa

South Africa's newest national park in an agricultural landscape

Herding 4 Health

Building back nature more complicated than just planting trees

Does lightning help grass grow?

Advancing Rangeland Ecology and Pasture Management in Southern Africa

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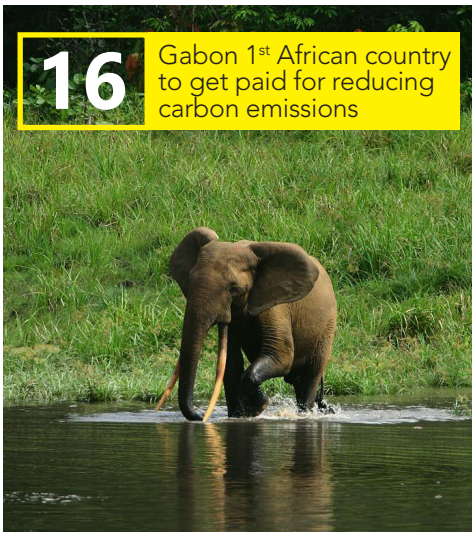

From our editor

Dear reader,

Welcome to the last issue of Grassroots for 2021.

It is that time of the year where we can all take a moment to reflect on the past year's events. There are definitely a few highlights that come to mind; the GSSA pulled off a highly successful virtual congress; the number of Grassroots-readers has significantly improved, and we have received several interesting feature articles.

Thanks to everyone who have contributed to these successes, those who have shared Grassroots on various platforms, and to all our readers!

Highlights of this issue

Patrick Rakau shares valuable information on how to manage the grazing cycle of annual ryegrass in our feature article. Herding 4 Health is a community development activity that promotes conservation outcomes while supporting people living in rural areas to find their way out of extreme poverty. Read more about it on page 10. Biodiversity research in South Africa is currently being choked by red tape. How can this issue be overcome? Valuable research on post fire changes in the Overberg Renosterveld is being conducted by the Overberg Renosterveld Conservation Trust using repeat photography.

Be sure to check out the submission deadlines to Grassroots for 2022 and share your exciting research findings with us. Please remember that Grassroots is also now open for advertising (see pricing options on page 19).

Lastly, Merry Christmas and Happy New Year!

Enjoy the read!

Best regards

Malissa

Contact us

If you have any feedback, comments, or suggestions, feel free to contact us at: info@grassland.org.za

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TREE OF THE MONTH

Figure 1. A mature Lavender Croton tree. Photo: Z.M. Smit

Croton gratissimum

(Lavender Croton / Bergboegoe) RSA Tree No. 328

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The lavender Croton is a medium shrub or small tree that can grow up to 10 m high. It is distributed throughout the savannahs of Africa but is limited to the northern and northwestern regions of South Africa. The species grows on stony soil types and rocky outcrops.

Croton gratissimus is divided into two varieties, namely; *C. gratissimus var. gratissimus*, the more common variant found in RSA, and *C. gratissimus var. subgratissimus*, which is more prominent further north into Africa.

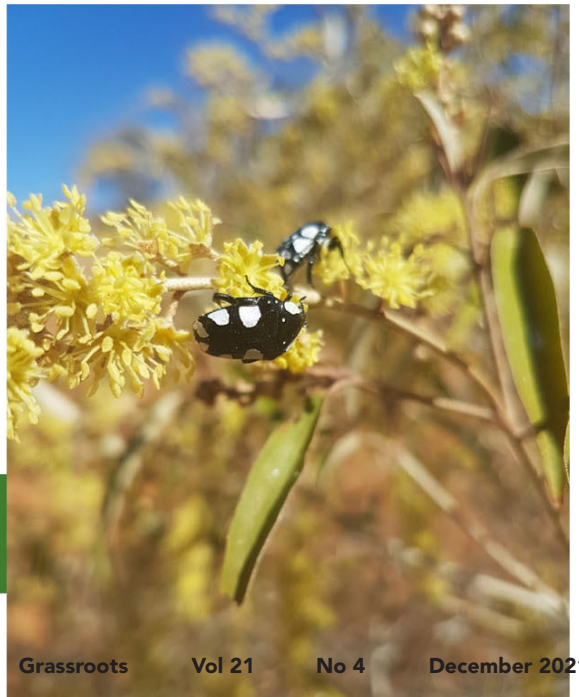

Figure 2. Fruit beetles feeding on the nectar rich flowers of a Lavender Croton tree. Photo: Z.M. Smit

Diagnostic features and phenology

- Leaves are simple and alternate, with a silver under-surface and hairy dark green surface.
- The flowers are cream to golden yellow carried in spikes up to 10 cm long.
- The small flower buds are typically present for months before the flowers open.
- The fruit is a three lobed capsule that turns from green to yellow as it matures.
- The bark is pale to grey in colour.
- Winter deciduous.

Figure 3. The distinctive silver colour of leaves' under-side. Photos: ZM Smit, http://treesa.org/Croton gratissimum/

Ecological value and uses

The leaves, although believed to be poisonous, are browsed by both game and livestock. Many bird species will eat the fruit when present while the flowers attract an array of insects. The hard, dense wood is used for roofing poles, hut poles and fencing. The aromatic leaves are dried and powdered by bushman to use as a form of perfume. Antioxidants that naturally occur in the plant can be used to manage cardiovascular, inflammatory, malignant and neurodegenerative diseases. The lavender Croton is also regarded as a good ornamental plant.

Figure 4. The ripe fruit

Figure 5. Example of yellow flowers carried in a spike.

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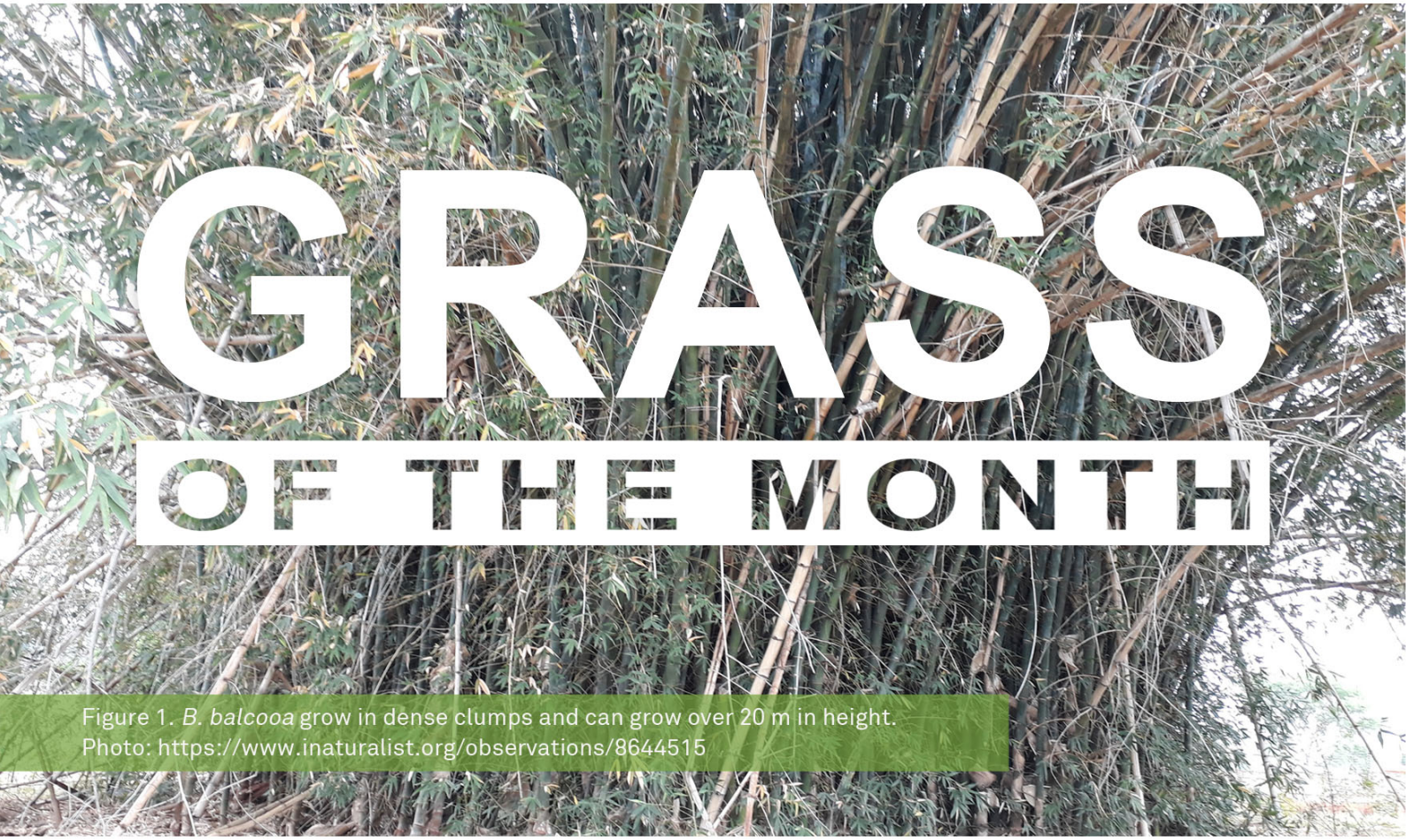

Figure 1. *B. balcooa* grow in dense clumps and can grow over 20 m in height.
Photo: https://www.inaturalist.org/observations/8644515

Bambusa balcooa

Bamboo/ Female Bamboo

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KZN Department of Agriculture and Rural Development

At a height ranging from 15-21 m tall, this species comes from the group of plants recognised to have the world's tallest grasses. As mentioned in Fish et al (2015), *B. Balcooa* is an exotic species in South Africa, naturalised from India and cultivated in many countries across the world. Although it is not used greatly in the commercial field in South Africa, it is known as the 'green gold of the 21st century in many areas due to its variety of uses.

Ecology

This bamboo prefers cool damp areas but can also tolerate drier conditions too. *B. balcooa* is recognised as one of the fastest-growing plants on the planet and, under ideal growing conditions, a growth of 250 cm in 24 hours has been recorded. As with many bamboo species, *B. balcooa* exhibits a rare flowering behaviour – with a flowering cycle of 32-45 years. Reproduction is therefore mostly vegetative and the plant produces dense clumps of rhizomes. In South Africa, it is mostly a plant used in gardens and, without correct management, does have the potential to become invasive. A good indication of his was shown in research where 400 plants were planted at a 5 x 5 m planting density. After a period of 7 years, the culm density was recorded at 7799 culms/ha.

Uses

In South Africa, it is mainly used as an ornamental plant in gardens as there are a few barriers to growing bamboo commercially at present. A water permit is required to grow any plantation and the Department of Water Affairs is currently in the middle of research to look at the water use and evaporation rates of bamboo. In other countries, bamboo has many uses:

- The lower third of the plant which has a very thick wall and the large stem diameter is good for charcoal.
- The middle third of the culm is more uniform and is used for flooring, furniture and for building materials.
- The top third is where all the branches and leaves are and can be used for animal feed, craft items and can be pulped and made into paper.
- The young shoots are regularly used as a vegetable and are eaten.

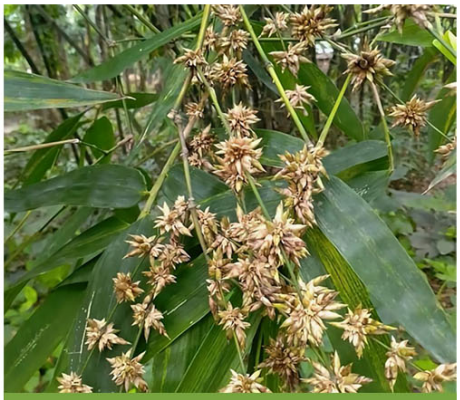

Figure 2. Flowers are rare and occur every 32-45 years.
Photo: BD Hayder

Figure 3. Shoots can be used as a food source for humans.
Photo: Tofiq Pasha Mooraj

Figure 4. The stems of *B. balcooa* are strong and can be used as an alternate source of building materials.

Be aware!

A long-horned beetle (*Chlorophorus annularis* – Bamboo Tiger Longhorn), which lives in the bamboo, has been recognised as an alien invader in South Africa. This beetle has been brought in with bamboo and bamboo products and, since then, has caused a lot of damage in the indigenous reed beds within Hluhluwe-iMfolozi Park (KwaZulu-Natal). The potential invasion of this beetle into KwaZulu-Natal may cause other concerns too as another host of this beetle is sugar cane. This could create extensive agricultural damage.

Figure 5. Bamboo Tiger Longhorn: an invasive alien invader linked to *B. balcooa*.
Photo: R. Taylor (https://www.inaturalist.org/observations/101394407)

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PASTURE OF THE MONTH

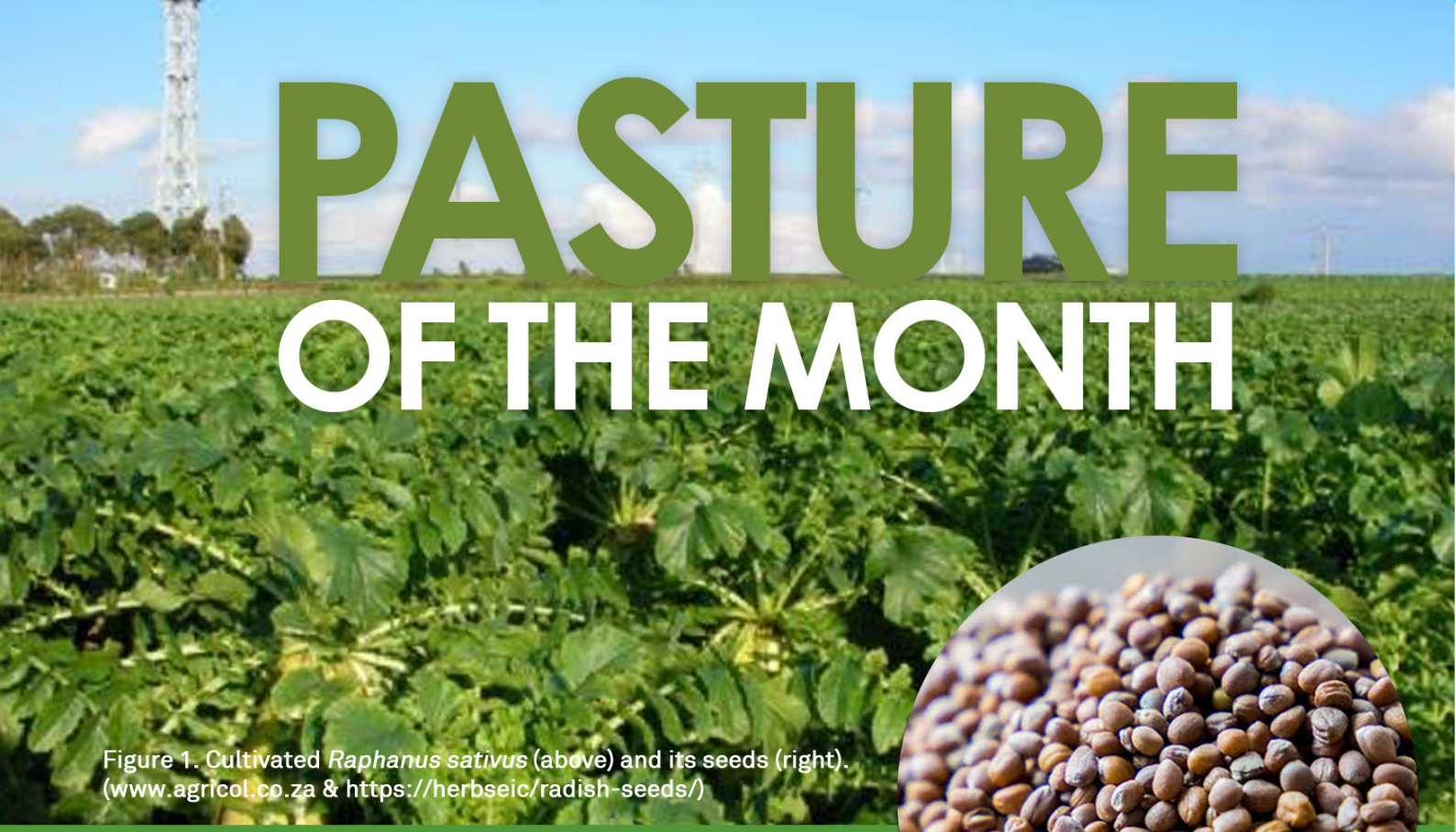

Figure 1. Cultivated *Raphanus sativus* (above) and its seeds (right). (www.agricol.co.za & https://herbseic/radish-seeds/)

Raphanus sativus

Japanese/Fodder Radish

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It is a good time to consider Fodder radish, as preparation for establishment can commence for the January establishment. Known to be part of the *Brassica* family, Fodder radish (*Raphanus sativus*) and more commonly known as Japanese radish, originated from East Asia and Europe. It is well known in the cooler summer rainfall areas of South Africa, as an autumn or winter fodder crop but is also popular in the drier western parts of the highveld region. It is most suited to cooler areas with dependable precipitation of at least 350 mm from January to April. Planting too early can result in seedling damage or even early seed production.

Even though it consists of a great deal of water, it is one of the most underated crops to fill feed gaps as the dry material is highly digestible. It is generally utilised as an annual but can be utilised in the second season if it was established late in the season.

Other Characteristics

- Fodder radish is characterised by initially having a short tuber, with leaves in a rosette form. Later, the short tuber lengthens to 600 – 700 mm with a light green colour.
- Noticeable is that the leaves closest to the tuber are lyre-shaped, smooth with hairs, whereas the top leaves are narrow and elongated.
- The inflorescence is and an extended flower cluster with small white or purple flowers.
- The seeds are yellowish and small and are situated in fleshy cork-like pods.
- Japanese radish can tolerate cold and is frost resistant.

Growth requirements

- Soils with good soil moisture conditions and moisture retention capacity, but not soils prone to waterlogging.
- Light sand/sandy loam soils.
- Soil needs to be prepared early to ensure the conservation of soil moisture and soil ameliorations to be done as deep as possible, as it is not advisable to mix the seed and fertilisers.
- A fine, firm seedbed is needed, and with fine seeds. It is always a good idea to roll the soil before and after sowing. Be careful not to roll the seed more than 25 mm into the soil.
- Established in rows, as well as a fair distance of spacing between plants.
- Seeding density is 2 kg/ha for rainfed land and 3,5 kg/ha where irrigation will be utilised.
- If soil pH (KCl) < 4, lime needs to be applied.
- Reacts good to P (phosphorous) and K (potassium), rather than N (nitrogen) during establishment, but should be guided by the soil analysis. Topdressing of N can be applied depending on the soil moisture status. Nitrogen can be administered as top dressing twice in the season under irrigation. Band placement of fertilisers is highly recommended.
- Weed control in between the rows is recommended with the top-dressing phase.
- Keep an eye out for insects, especially during autumn.

Uses

Production potential varies quite a bit as it is influenced by establishment time and rainfall. It ranged between 40 – 60 tons of green feed/ha, resulting in 4 – 6 tons of dry material/ha. When established in January, the radish will be ready by end of April. Its production will decline with time.

The leaves and tubers can be grazed by cattle and sheep, but less wastage will take place if it is harvested and given to dairy cattle either as is or chopped. It is considered to be a substitute for roughage.

The radish is also used in cover crop seed mixes as the tubers can "drill" through hardened soils, that assist with water infiltration.

Figure 2. *Raphanus sativus* with leaves and flowers. Photo: Y Brits

Figure 3. *Raphanus sativus* leaves harvested. Photo: MA Ngoasheng

Beware of

too dense spacing: it can negatively impact the plant as it is competing for nutrients and sunlight.

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To cut or not to cut? How should farmers manage grazing cycles of annual ryegrass-*Lolium multiflorum*

PN Rakau

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Annual Ryegrass – *Lolium multiflorum* is a tufted grass mostly planted under irrigation, and is relatively tolerant to different conditions in South Africa. There are two types of annual ryegrass, namely; the Italian and Westerwolds types. Italian types become reproductive with a significant cold period and have a long growing season (+/- 12 months) when planted in autumn, and even longer (+/- 18 months) when planted in spring. Autumn planting can yield between 14 to 20 t DM/ha/season and three grazing cycles/season. Most Italian types have the ability to persist. Westerwolds types do not require a prolonged cold period to reach a productive stage and will produce better dry matter yield in mid-winter and spring. Therefore, it is also known as a "quick starter". It will become reproductive in October when planting it in autumn.

The Agricultural Research Council (ARC) Animal production (AP) forage breeding unit based at Cedara has bred 27 registered cultivars of both Italian and Westerwold ryegrass since 1993 and were granted Plant Breeders Rights (PBRs). Two new Italian ryegrass cultivars, both tetraploid and diploid, will be released in the near future.

Due to annual ryegrass's quick establishment, it can be utilized 8 to 10 weeks after planting when planted in autumn. The first grazing cycle should take place as soon as canopy cover becomes dense to prevent the uprooting of the plant by animals during grazing. There are three ways or indicators that can be used to determine if the ryegrass plant is ready for grazing, namely:

- Three-leave stage: ryegrass plants will maintain only three leaves. If the fourth leaf comes out, the first leaf will die. This will happen as long as the grass is not cut or grazed.
- Grazing interval of 28 to 30 days: most of the ryegrass cultivars take about 28 to 30 days to reach three-leave stage.
- Plant height: ryegrass plant can reach a height of 40 to 60 cm before lodging.

Farmers will have more choice on which method or indicator to use when managing their ryegrass grazing cycles. All these three methods are effective and related to each other and produce almost the same results. The plant height method can be applied for the first grazing cycle after planting.

The 28 to 30 days grazing interval method can be applied during winter and early spring because most of the ryegrass cultivars are at their peak growing stages. Lastly, the three-leave stage method can be applied during late spring and summer if the planting date was in autumn.

This information will help to improve the management of grazing cycles and the performance of a ryegrass field to increase the performance of dairy animals. Farmers will reduce the high cost of supplement feeds during the winter season if ryegrass grazing cycles are improved.

Acknowledgements: The Agricultural Research Council (Cedara, Animal Production, Range and Forage) is gratefully acknowledged for funding the project and institutional support.

Figure 1. The plant height of annual ryegrass at ARC-Cedara fields is between 50 and 60 cm.

Figure 2. The three-leave stage of ryegrass.

Figure 3. The annual ryegrass trial at ARC Cedara Research station, KwaZulu Natal, South Africa. The trial was planted on March 2021 and harvested monthly or at 28-day intervals.

Herding 4 Health

Team Africa Geographic

Current Address: Africa Geographic Stories
Reprinted from: https://bit.ly/3pVLMlY

Herding 4 Health is a community development activity that promotes conservation outcomes while supporting people living in rural areas to find their way out of extreme poverty. It does this by teaching community members to make use of what they already have – cattle and other livestock.' Peace Parks Foundation.

Livestock herding and wildlife conservation are often seen as anathema to each other. A combined Peace Parks and Conservation International initiative called Herding 4 Health (H4H) is changing these perceptions while improving livestock health and wealth for local people living on the fringes of protected areas. The programme is also restoring rangelands and increasing biodiversity.

Livestock and protected areas

Rural village landscapes are multifunctional and play a critical role in providing essential ecosystem services such as food production, grazing, rainwater absorption and carbon cycles.

In many parts of Africa, livestock animals are massively important to rural people. They provide milk, meat and a form of banking for people living on the borders of protected areas. Yet increasing numbers of livestock, grazing without coordination close to villages has caused extensive rangeland degradation which, in turn, has resulted in poor livestock health, decreased food security, and increased poverty.

Another problem community livestock owners face is access to markets for those who want to sell their animals. Livestock is generally in poor condition and live animals cannot be sold across veterinary cordons. Foot and Mouth disease is a major problem around many Southern African protected areas. The disease is carried by free-ranging buffalo, and cloven-hooved livestock is extremely susceptible to it.

Many of the problems can be put down to herds not being managed optimally. Historically, herds would have been looked after all day – drop and go herding did not happen. These days, kids go to school and modern life makes it very difficult for herds to be monitored full time, especially in areas that are not fenced (a situation that brings its own set of problems). As Mike Grover, Project Manager of the H4H programme in the Mnisi Tribal Authority (Mnisi TA) on the borders of the greater Kruger National Park says, 'Livestock is not a problem. Unmanaged livestock is a problem.'

Figure 1. Cattle at dawn on the border of the Greater Kruger.

An innovative solution

Jacques van Rooyen, Director of the Herding 4 Health Programme who developed the H4H model grew up on a cattle farm where he developed a love for nature. He went on to study animal science, rangeland science and then wildlife management before helping to plan and set up game reserves in various parts of Southern Africa.

His experience and work in veterinary science drew him into the people and protected areas interface where he felt there were a lot of specialists doing good work in human-wildlife conflict, rangelands, animal health and production, ecology and tourism. Few, however, were taking an integrated, systems view of the complicated situation.

Van Rooyen realised the problems on the borders of protected areas were based on rangelands, community politics, land use clashes (conservation versus farmers), development, disease control and market access. In other words, he realised the need for a delicate balance between ecological and social priorities.

He also saw, however, that these complex problems needed a simple, community-driven solution that could be modified for local conditions and priorities.

Herding 4 Health uses skills already in the communities – herding and kraaling predominantly – and the introduction of new technology. It enables regenerative livestock production and enhances social equity through training and enterprise development.

Figure 2. A predator-proof boma in the bushveld.

Figure 3. Clockwise from top left: working in the predator-proof boma; a herder tending his livestock in the bushveld; a collective herd grazing close to the home village; a herd leaves the predator-proof boma to go grazing.

The model facilitates and integrates four pillars:

- healthy rangelands;
- healthy animals;
- thriving livelihoods; and
- good governance and the development of policies that incentivise the adoption of sustainable, climate-smart and wildlife-friendly livestock management practices.

Eco-rangers

One of the key features of the Herding 4 Health solution is the eco-rangers. These are people selected by their communities to be the custodians of the H4H programme at the local level. The eco-rangers are taught professionalised herding techniques. They learn planned grazing, animal production, primary animal care, tracking, security and various applicable administrative skills. This is facilitated by the SA College for Tourism's Herding Academy in Graaff-Reinet and the Southern African Wildlife College. The eco-rangers are streamed according to their strengths – e.g. digital reporting, communication, vegetation surveys etc.

H4H eco-rangers are not just cattle herders – they are communicators, record keepers, trackers, cattle health assessors and vegetation surveyors. After four or five years, a herder can become an eco-trainer.

A good example is Cliff Nkuna of the Mnisi Tribal Authority near the Kruger National Park. Cliff wanted to be a field guide because that was how he saw himself making the best living. Now, however, with the training and experience he has from H4H, he is on a career path that allows him to stay in his village, make a living, and contribute to the long-term well-being of his community. He is an eco-trainer.

Through the eco-rangers, community livestock owners have a sustainable, traceable supply of animals to the grass-fed red meat market. This is hugely important as farmers in communal areas currently only supply 5% of the South African red meat market despite owning 47% of the livestock.

Case study - Limpopo National Park, Mozambique

Limpopo National Park (LNP) is part of the Great Limpopo Transfrontier Conservation Area (GLTFCA). The Herding 4 Health programme in LNP, consists of six communities with 12,000 cattle in an area of 150,000 ha. Two of the communities are in the park and the other four are in the buffer zone. Before H4H arrived, the cattle were moving 20 km from the village before they reached the first grass – every day! The herders were also losing up to 20 animals a month to predators. Since the advent of H4H in the area, the cattle do not return to the villages during the summer months and not one animal has been lost to predators.

For rangelands, the ecological plan is based on science and best practice, where community livestock are grazed together in large herds in a coordinated manner such that their effects on the rangeland are positive and restorative.

In essence, this is how the programme works:

- The community brings their livestock together into large herds.
- Grazing is planned around available water sources.
- In summer, when water is relatively abundant, the herds do not return home every night.
- In the evening, the herders erect predator-proof bomas. Each one takes about an hour to set up and can house 600 cattle. The herders carry the bomas with them and stay with their respective herds for around a week at a time.
- Over this summer period, land close to the villages rests and regenerates.
- In winter, when the crop fields are fallow and the grass close to the village has recovered, the herds move

Figure 4. Clockwise from top left: Cattle in a communal dip; veterinary intervention; helping community farmers with market access; checking fences; a communal herd moving into a dip.

closer to home, taking advantage of the summer forage growth that has accumulated. The animals drink from more permanent water sources.
- Bomas are placed in degraded areas so that the dung and urine of the 600 snoozing, ruminating cattle can fertilise the land and help it recover.
- Hooves break the surface, urine and dung fertilise the soil, denuded areas are left to rest and recover. This is very similar to the natural movement of wild ungulates such as the wildebeest of the Great Migration.

The first eco-rangers in this area were trained in January 2020 and the community mobilised another 100 volunteers. H4H provided rations for all. The government is supportive of the programme because it makes their job easier. Extension officers don't have to work nearly as hard to have cattle treated for disease or dipped because the animals arrive for treatment in collective herds. Diseases are more easily contained and treated.

Case study - Mnisi tribual authority

We spoke to Mike Grover, Conservation South Africa Landscape Director of the Herding 4 Health programme in the Mnisi Tribal Authority (Mnisi TA) on the borders of the greater Kruger National Park. In this area of South Africa, the same conditions that prevail in the LNP of Mozambique, do not exist. The H4H model, however, is designed to be flexible and work with local knowledge and local conditions.

Of the national cattle herd – i.e. all the cattle in South Africa, only about five per cent are available to the formal meat and dairy markets. The reasons for this include veterinary cordons and poor animal conditions (because of poor grazing and untreated diseases). In the Mnisi region, the major issues are:

- Cattle raiding crop fields
- A lack of collective herding
- Animals left unmonitored for lengthy periods because
  - Fences have reduced predation.
  - Children who used to herd the cattle go to school.
  - Water provision is such that owners of cattle can simply leave their animals in the communal grazing lands for the day without having to lead them to and from water.
  - Few cattle owners are actively involved in looking after their animals. For example, some people own more than 150 cattle but are employed and not involved in community agricultural structures.
- At the moment there is an underlying structure for governance and organisation, but it is very challenging to capacitate and there are few active farmers involved.

The lack of continuous herding results in poor disease reporting and monitoring, which in turn means that overall herd health is reduced.

Another significant challenge is building trust. H4H has been working with the Mnisi TA for eight years now. The programme began with the construction of an IT centre and a bush thinning initiative – relatively easy interventions. The processes involved in the H4H programme are natural but complicated and it takes a great deal of input to change people's perceptions around managing livestock.

The local solution

As mentioned, the problems, and therefore the solutions that apply to the LNP do not apply to the Mnisi TA. In the LNP, the major objectives are improved rangeland, intensive herding and the reduction of human-wildlife conflict. In the Mnisi TA, the high-density herding practised in LNP would be almost impossible to achieve because of the fencing already in place.

Herding 4 Health is not a cookie-cutter system and it is not just about herding. It is about optimising agricultural practices for the area in question to the benefit of rural farmers, their animals and communal rangelands. The programme aims to create resilience through adaptability, collective bargaining and saving money.

H4H in the Mnisi area, therefore, aims to bolster and capacitate agricultural structures so that cattle owners are better able to keep records on their animals and maintain good herd health. H4H also hopes to improve access to the market for beef cattle owners. The Mnisi area is not as remote as some H4H target zones and it is intensively researched by tertiary organisations. It is therefore a great testing ground for H4H concepts. One of these is the mobile abattoir – which is an abattoir that travels through rural areas negating the need for cattle owners to transport their animals to slaughter. It conforms to all health and safety standards required

by law for the commercial sale of meat. The aim is to supply local markets – tourism operations, small scale retailers and businesses with grass-fed, ethically raised meat (cattle, goat and game). The meat will be largely for niche markets, promoting the idea that consumers should know what they are eating and where it comes from.

After eight years in the Mnisi area, the first H4H eco-rangers are now becoming community leaders, pushing the H4H values, with years of local, applied knowledge. Perhaps one of the greatest testaments to the success of the H4H programme was that during the COVID lockdowns, people stuck to the H4H stewardship agreements because they have begun to see the benefits. The community and the programme just carried on with minimal, virtual support. This was a pivotal moment in the history of H4H in the Mnisi TA.

Now, with the experienced eco-trainers on the ground, mentorship can take place over the internet which means the programme can be expanded elsewhere because there is a critical mass of trained and passionate people on the ground in the Mnisi TA. As mentioned above, Cliff Nkuna and the Dixie community have a great story to tell.

The future

Herding 4 Health is expanding and its current project sites include:

- Mnisi Community (South Africa) – Great Limpopo TFCA
- Limpopo National Park and surrounds (Mozambique) – Great Limpopo TFCA
- Greater Lebombo Conservancy (Mozambique) – Great Limpopo TFCA
- Succulent Karoo (Namaqualand) (South Africa) – /Ai/Ais-Richtersveld TP
- Mzimvubu Catchment (South Africa) – Maloti-Drakensberg TFCA
- Maputo Special Reserve (Mozambique) – Lubombo TFCA
- Habu & Eretsha communities (Botswana) – Kavango Zambezi TFCA
- Maramani communities (Zimbabwe) – Greater Mapungubwe TFCA
- Simalaha Community Conservancy (Zambia) – Kavango Zambezi TFCA

The programme is expanding in Botswana with a multi-million dollar programme underway that will see Botswana funding and deploying 6000 eco-rangers. Over 20,000 unclaimed cattle have been found in parts of Botswana, some wandering several hundred kilometres from their owners – a direct result of ad hoc herding.

H4H allows the government to control the masses of rural cattle. They can mitigate disease and it is hoped that controlling disease will become much easier and with this, access to markets.

A number of major safari operators in Botswana have indicated a willingness to buy local, grass-fed beef as long as it can be shown that herders adhere to the H4H principles. Successful implementation of the programme may also see herds allowed onto wildlife concessions in tough times or for ecological reasons (simulating the grazing effects of large wild animal herds).

Conclusion

One of the greatest challenges facing wildlife conservation in Africa is the nexus between people and protected areas. Herding 4 Health is proving a viable way to improve the livelihoods of people living in rural areas near conservation reserves. It is making a significant difference to the reduction of human-wildlife conflict.

Through effective herding methods, predators have far less impact on livelihoods which in turn reduces revenge killing and a general resentment for wild predators. At the same time, improved rangelands are increasing the number of cattle that land can support while improving rangeland health.

This is a hugely important project and it will be fascinating to see it rolled out further, hopefully with increased support from local people, NGOs and government.

Resources

For more about the H4H programme and the Peace Parks Foundation see here.

Figure 5a and b. In many parts of Africa, livestock animals are massively important to rural people. Yet increasing numbers of livestock, grazing without coordination close to villages has caused extensive rangeland degradation.

South Africa's newest national park will be in an agricultural landscape

Sheree Bega

Current Address: Mail & Guardian
Reprinted from: https://bit.ly/3oV7FTb

Thembanani Nsibande remembers driving through the mountains of the Eastern Cape five years ago and being struck by the beauty of the unspoilt, rugged landscape.

"When I was on the Naude's Nek Pass [South Africa's highest lying road at more than 2500 m] I asked myself why hasn't anything been done in terms of conservation for this special area," said Nsibande, who had just moved to the province from KwaZulu-Natal. "It's such a mind-blowing part of the country."

That conservation work is now underway with Nsibande, who is now the World Wildlife Fund-SA's (WWF-SA's) project coordinator for the planned park, championing efforts on the ground for the development of South Africa's newest park: the NE Cape Grasslands National Park.

This 30000 ha high-altitude park will stretch across the Rhodes, Naude's Nek and Nqanqarhu areas, which boasts vast tracts of grasslands. The project is a collaboration between the South African National Parks (SANParks) and WWF-SA. The national park marks a novel approach to protected area expansion because it will be in an agricultural landscape.

Through biodiversity stewardship, people on communal land and private landowners can incorporate their land in the park on a voluntary basis and stand to benefit from a range of financial incentives.

The area is rich in nature and endemic species, and lies in the Eastern Cape Drakensberg Strategic Water Source Area, a source of freshwater for people living downstream.

Nsibande has spent the past three years meeting traditional leaders, communal and commercial farmers, landowners, residents, municipalities, NGOs and the forestry sector, to garner support for the project.

"We've been working hard because this is a very special place," he said. "We have all three types of crane species here — wattled cranes, crowned cranes and blue cranes — which are all species of special concern. We also have the critically endangered bearded vulture and the Cape vulture, the bald ibis and

Figure 1. On a high: The NE Cape Grasslands National Park will encourage communities and farmers living in it to be park stewards. (Photo by Madelene Cronjé)

the secretary bird. Mountain reedbuck are found in this area.

"We've got very special geology, like what you see in Golden Gate, beautiful mountains and rock art paintings on both the communal and private lands. Every winter, the mountains are covered in snow, and in December, there are waterfalls everywhere," Nsibande said.

The park is still at the early stages of planning and feasibility, said Kristal Maze, the general manager of park planning and development at SANParks.

"We're finalising our planning to see where exactly would be suitable for this new national park."

It is a "national park with a difference", Maze said. "This is because we're really looking at working with landowners and communities as a foundation for this park … where landowners and users are the main custodians for biodiversity. This is about recognising that this is a working landscape and that there are agricultural activities and livestock grazing by the communities and private landowners."

People on communal land have thrown their weight behind the project, as have "quite a few private landowners. Quite a lot of this park is going to depend on landowner willingness and enthusiasm for conservation objectives."

The project aims to raise significant government funding for the restoration and maintenance of the landscape for water security and creating jobs in alien plant clearing and wetland restoration.

Grasslands are poorly protected in South Africa, Maze said.

"What we're needing to do as a country is improve the protection of the grasslands biome as a whole which is very rich in species, both threatened and endemic, and is also very important from an ecosystems perspective as well as ecosystem services."

As a strategic water source area, the region is critically important and underpins a range of production sectors and economic development.

"So what we're wanting to do is to foster good management of the ecosystems in this area to secure the water-related benefits that the area provides," she said.

The goal is that by the end of 2022, the first set of people on communal land and private landowners will be ready to sign an agreement with SANParks.

"I imagine that by 2023 if we work very well, we'll have some of the first areas declared," Maze said, adding that SANParks would be involved in a limited number of land acquisitions.

Gabon is the first African country to get paid for reducing carbon emissions

Rosie Frost

Current Address: euronews.green
Reprinted from: https://bit.ly/3pOqcjd

Gabon has become the first country in Africa to get paid for reducing carbon emissions and forest degradation.

The €14 million reward is based on an independent assessment of the country's efforts to reduce CO_2 emissions in 2016 and 2017.

These results-based payments are part of a breakthrough agreement between Gabon and the Central African Forest Initiative (CAFI). The 10-year deal, signed in 2019, could see the country receive almost €126 million if it meets its targets to further cut carbon emissions in half by 2025.

CAFI was launched in 2015 by the United Nations and is backed by donors including the Norwegian government.

"This is the first time an African country has been rewarded for reducing forest-related emissions at the national level," says Sveinung Rotevatn, Norway's Minister of Climate and Environment.

"It is extremely important that Gabon has taken this first step. The country has demonstrated that with strong vision, dedication and drive, emissions reductions can be achieved in the Congo Basin forest."

Gabon's forests cover 88 per cent of the country and are home to unique wildlife including 60 per cent of the world's remaining forest **elephants**. The trees absorb a total of 127 million tons of CO_2 every year, the equivalent of removing 30 million cars from the world's roads.

To preserve its near-pristine rainforests, the country has created 13 national parks since the early 2000s. Since 1990, deforestation rates have historically been low in its territories - less than 0.08 per cent.

This means that reducing carbon emissions by protecting forests is a difficult

Figure 1. Gabon's rainforests absorb a total of 127 million tonnes of CO_2 every year. (Copyright E.J.H. DAMAS)

task but it hasn't stopped the country from introducing ambitious targets.

Funding further forest protection

Gabon's Minister of Water and Forests, the Seas and the Environment, Professor Lee White, says the first instalment will help finance further projects to preserve Gabon's forests.

"It also paves the way for Gabon to finalise the systems that will be required to enable the country to formally sell carbon credits in the future."

CAFI's recognition of the country's efforts is encouraging as they are the global reference for these kinds of payments.

The money will go towards investments in a whole host of projects to reduce carbon emissions including community forestry, scientific research and systems that support protected areas. White says that CAFI's recognition of the country's efforts is encouraging as they are the global reference for these kinds of payments. "We are working with partners to develop payment mechanisms that will enable us to stabilise forests and reverse deforestation and forest degradation in HFLD (high forest/low deforestation) countries, rather than simply slowing deforestation."

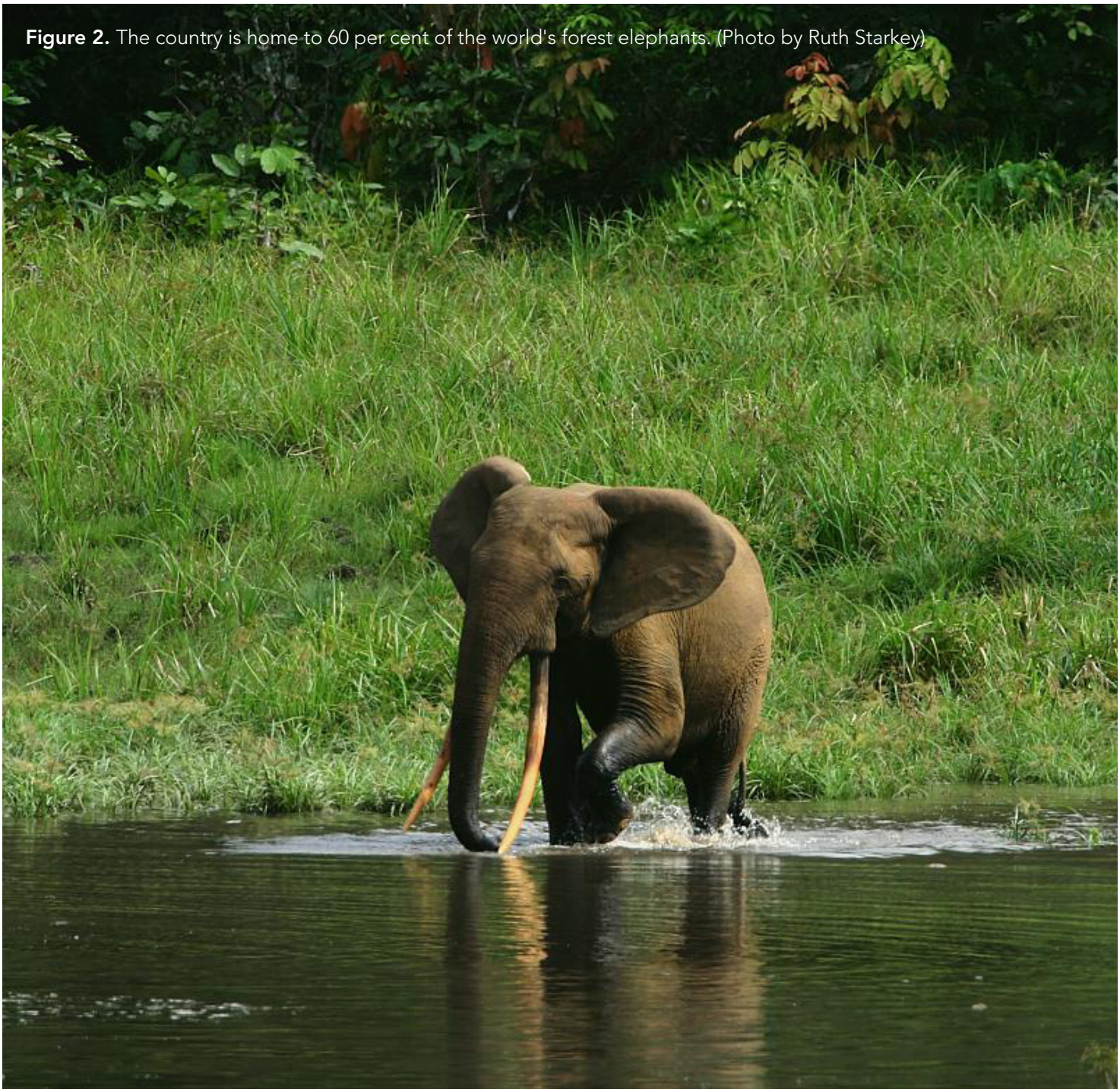

Figure 2. The country is home to 60 per cent of the world's forest elephants. (Photo by Ruth Starkey)

Cows and cars should not be conflated in climate change debates

Ian Scoones

Current Address: Institute of Development Studies
Reprinted from: https://bit.ly/3plpFis

With world leaders gathered for the COP26 summit in Glasgow, there is much talk of methane emissions and belching cows. The Global Methane Pledge, led by the US and EU and now with many country signatories, aims to reduce methane emissions by 30% by 2030. This is seen as a "quick win" to reduce global warming and will have major implications for livestock production.

Livestock has become the villain of climate change. Some researchers claim that 14.5% of all human-derived emissions come from livestock, either directly or indirectly. There have been widespread calls for radical shifts in livestock production and diet globally to address climate chaos. But which livestock, where? As a new report, I co-authored argues, it is vitally important to differentiate between production systems.

Not all milk and meat is the same. Extensive, often mobile, pastoral systems – of the sort commonly seen across the African continent, as well as in Asia, Latin America and Europe – have hugely different effects to contained, intensive industrial livestock production.

Yet, in standard narratives about diet and production shifts, all livestock are lumped in together. Cows are misleadingly equated with polluting cars and beef with coal.

The simplistic "all livestock are bad" narrative is promoted by campaign organisations, environmental celebrities, rich philanthropists and policymakers alike. Inevitably, it dominates media coverage. However, a much more sophisticated debate is needed.

Delving into data

Our report delves into the data and highlights the problems with using aggregate statistics in assessing the impacts of livestock on the global climate.

Some types of livestock production, especially those using industrial systems, are certainly highly damaging to the environment. They generate significant greenhouse gas emissions and cause serious water pollution. They also add to deforestation through demand for feed and expanding grazing areas, for example. And, reducing the amount of animal-source foods in diets, whether in the global north or south, makes much sense, both for the environment and for people's health.

But industrial systems are only one type of livestock production. And aggregate emission figures do not pick up the nuances of this reality. Looking across life-cycle assessments – a technique widely used to assess the impacts on climate change from different agri-food systems – we found some important gaps and assumptions.

One is that global assessments are overwhelmingly based on data from industrial systems. A frequently quoted paper looking at 38,700 farms and 1,600 processors only focused on "commercially viable" units, mostly from Europe and North America. However, not all livestock are the same, meaning that global extrapolations don't work.

Research in Kenya, for example, shows how assumptions about emissions from African animals are inaccurate. Such livestock are smaller, have higher quality diets due to selective grazing and have physiologies adapted to their settings. They are not the same as a highly bred animal in a respiration chamber, which

Figure 1. Cattle driven into the Kenyan capital Nairobi for new pasture amid a severe drought navigate through city traffic. (Photo by Simon Maina/AFP via Getty Images)

is where much of the data on emission factors comes from. Overall, data from extensive systems are massively underrepresented. For instance, a review of food production life cycle assessments showed that only 0.4% of such studies were from Africa, where extensive pastoralism is common across large areas.

Another issue is that most such assessments focus on emissions impacts per animal or per unit of product. This creates a distorted picture; the wider costs and benefits are not taken into account. Those in favour of industrialised systems point to the high per animal methane emission from animals eating rough, low-quality forage on open rangelands compared to the potential for improved, methane-reducing feeds in contained systems. This misses the point: a wider, more integrated systems approach must encompass all impacts, but also benefits. For instance, some forms of extensive grazing can potentially increase soil carbon stocks, adding to the already significant store of carbon in open rangelands.

Then there's the fact that methane and carbon dioxide have different lifetimes in the atmosphere and are not equivalent. Methane is a short-lived but highly potent gas. Carbon dioxide sticks around in the atmosphere effectively forever. Reducing warming can be addressed in the short term by tackling methane emissions, but long term climate change needs to focus on carbon dioxide. It, therefore, makes a big difference in how different greenhouse gases are assessed and how any "global warming potential" is estimated. Simply put, cows and cars are not the same.

It also matters what baseline is used. Pastoral systems may not result in additional emissions from a "natural" baseline. For example, in extensive systems in Africa domestic livestock replace wildlife that emits comparable amounts of greenhouse gases. By contrast, industrial systems clearly generate additional impacts, adding significant environmental costs through methane emissions from production, the importation of feed, the concentration of livestock waste and fossil fuel use in transport and sunk infrastructure.

Climate justice

A more rounded assessment is necessary. Extensive livestock contributes to emissions, but it's simultaneously true that they produce multiple environmental benefits – including potentially through carbon sequestration, improving biodiversity and enhancing landscapes.

Animal-source foods are also vital for nutrition, providing high-density protein and other nutrients, especially for low-income and vulnerable populations and in places where crops cannot be produced.

Across the world livestock – cattle, sheep, goats, camels, yaks, llamas and more – provide income and livelihoods for many. The world's rangelands make-up over half the world's land surface and are home to many millions of people.

As countries commit to reducing methane emissions, a more sophisticated debate is urgently needed, lest major injustices result. The danger is that, as regulations are developed, verification procedures approved and reporting systems initiated, livestock systems in Africa and elsewhere will be penalised, with major consequences for poor people's livelihoods.

Building back nature is more complicated than just planting trees

The UN officially launched the Decade on Ecosystem Restoration programme, but planting trees anywhere and everywhere is not a silver bullet to combat climate change.

Catherine Del Monte

Current Address: Daily Maverick
Reprinted from: https://bit.ly/3DNph7z

Just two months before the Intergovernmental Panel on Climate Change (IPCC) report issued a "code red for humanity" in August, the United Nations Environment Programme in collaboration with the UN's Food and Agriculture Organisation launched the Decade on Ecosystem Restoration (UN Decade).

The UN Decade is a global call to action that runs from 2021 to 2030 and which, according to the UN, is the timeframe scientists recognise "as humanity's last chance to prevent catastrophic climate change" and essentially gives society just shy of a decade to revive and restore what is left of Earth's ecosystems.

During the virtual launch gala of the UN Decade, UN Secretary-General António Guterres's opening remarks were sobering:

"We are rapidly reaching the point of no return for the planet. We face a triple environmental emergency: biodiversity loss, climate disruption, and escalating pollution. For too long, humanity has cut down the Earth's forests, polluted its rivers and oceans and ploughed its grasslands into oblivion.

"We are ravaging the very ecosystems that underpin our societies and in doing so, we risk depriving ourselves of the food, water and resources we need to survive."

Restoring the planet's ecosystems is so urgent that the UN talks of a mass extinction if we fail to act within the next 10 years.

But effective ecosystem restoration is complex developmental work that is not as simple as planting a tree here and there. In fact, the risks of tree-only campaigning to ecosystem restoration are manifold.

Emeritus professor of biological sciences at the University of Cape Town William Bond is one of the lead authors in new research busting the myth that planting trees everywhere is the silver bullet to slowing global warming and explains why we need areas like open grasslands in the savannas.

"What many don't realise is that grasslands store carbon in their soils and reflect more sunlight back into space than forests, playing a very important part in cooling the earth."

"I am trying to champion non-forested parts of the world, 'open ecosystems', which are threatened by global plans to plant trees, millions of hectares of them, with Africa particularly targeted. I see this as a major threat to Africa since our sun-loving fauna and flora can be rapidly exterminated by shade of, typically, conifer and eucalypt plantations," says Bond.

Africa contains more grasses than any other continent. According to the South African National Biodiversity Institute, covering 46% of its area, the savanna is the biggest biome in southern Africa.

Bond explains that savannas are characterised by grasslands – an open habitat peppered with a handful of trees – and that in a healthy grassland ecosystem there is a very delicate balance between trees and grasses that needs to be maintained for the diversity of animal species that it supports to survive and thrive.

Tree-planting plans to offset carbon threaten the ancient grasslands and everything it supports, he adds.

"What many don't realise is that grasslands store carbon in their soils and reflect more sunlight back into space than forests, playing a very important part in cooling the Earth."

Grasslands are millions of years old and Bond cautions ecosystem restoration projects to question whether the trees are restoring previously forested areas or whether they are destroying an ancient grassland and existing ecosystem.

Ecosystem restoration is an intricate process that takes time.

Figure 1. Savannas are characterised by grasslands - open habitat peppered with a handful of trees. (Image: Unsplash/ Damian Patkowski)

An example of an organisation working towards realising the UN Decade's vision in South Africa is ecosystem restoration NGO Greenpop.

Greenpop began in 2010 as an urban greening initiative with the goal of planting 1,000 trees during Arbour Month. Over 11 years Greenpop has planted exactly 159,518 trees and expanded its work in four countries including South Africa, Malawi, Zambia and Tanzania, and incorporated four restoration themes including forest restoration, urban greening, food gardens and environmental awareness.

"The idea was to try and bring some greenery into spaces where there was never any real investment into greening, so we were planting mostly at schools and community centres with the purpose of trying to bring shade into these spaces and increasing pride of place," says Greenpop's head of programmes, Zoë Gauld-Angelucci.

Gauld-Angelucci, who has been with Greenpop for nearly eight years, completed her master's thesis on the benefits of planting trees in an urban environment, of which, she says, there are many.

"Trees have environmental benefits like reducing stormwater runoff and purifying the air, as well as psychological benefits like people tend to be less stressed if they have a green space surrounding them," she explains.

"There are also economic benefits like reducing the urban heat island effect, bringing cooler temperatures into city spaces which tend to be hot because there is so much concrete and tar."

Since 2018, Greenpop's urban greening projects in Cape Town have changed to focus on growing fynbos instead of trees due to the drought that ravaged the city and surrounding areas in 2018.

"A lot of climate change mitigation projects at the moment are focusing on planting forests that are not necessarily in previously forested areas and that comes with its own issues."

Gauld-Angelucci says Greenpop's forest restoration projects work through reforestation – regrowing/restoring a forest that has been degraded through clearing for cash crop agriculture or mining to what it once was – not afforestation – planting trees on a piece of land that was not traditionally forest.

She stresses the importance of the distinction: "A lot of climate change mitigation projects at the moment are focusing on planting forests that are not necessarily in previously forested areas and that comes with its own issues."

Considering a site for restoration

Through its Forest for Life restora-

tion programmes Greenpop ultimately aims to "plant 500,000 trees to restore degraded forest areas, increase biodiversity and expand ecosystem services across sub-Saharan Africa by 2025", says Gauld-Angelucci, who explains that the essence of these projects is to view forests as a holistic part of the landscape.

"A forest does not just sit there by itself and not interact with anything around it. There are animals and communities that rely on forests and legislation that determines use rights; there is also neighbouring vegetation that has to be taken into consideration."

The first step in restoring any degraded landscape is to determine *why* the site became degraded in the first place, which means studying factors such as threats to a particular landscape to establish whether it would make a good candidate for restoration.

Gauld-Angelucci says obvious markers of degradation include when a site is devoid of vegetation but there are visible tree stumps indicating that trees have either been cut down or burnt or where the landscape is suffering from a high degree of erosion.

Another marker of degradation is a high prevalence of alien invasive plants. "You could have a piece of land covered in trees and vegetation but it does not mean that it is healthy because it could be that those are alien species and are posing a risk to indigenous vegetation because they are a very high fire risk."

It is a complex, lengthy and delicate process and "we [Greenpop] would never show up at a piece of land and say, 'hey, this looks like a good place to plant a whole bunch of trees'".

Greenpop runs its restoration projects with local community organisations and partners where it receives applications from landowners and community organisations asking for help to restore a piece of land that has been degraded over time due to a number of reasons.

The next steps include determining what vegetation the site should be restored to and appropriate methods.

"This is an incredibly complex step and you have to approach it from multiple angles," says Gauld-Angelucci, explaining that the main way Greenpop determines the history of any degraded site is through Biodiversity Geographic Information System maps provided by the National Biodiversity Institute. These show the indigenous ecosystems for every part of South Africa.

"You can zoom in and determine whether an area was once Afromontane forest or Cape Flats Sand Fynbos, for example. This is usually a really good method to determine what type of vegetation the land was covered with before it was degraded."

Sometimes, however, the land can be a "mosaic area".

"This means the landscape can support forest as well as fynbos and what probably happened in the past was the forest and the fynbos lived next to each other in patches and then the fynbos would catch on fire and some of the forest would burn down and then there wouldn't be a fire for a while and some

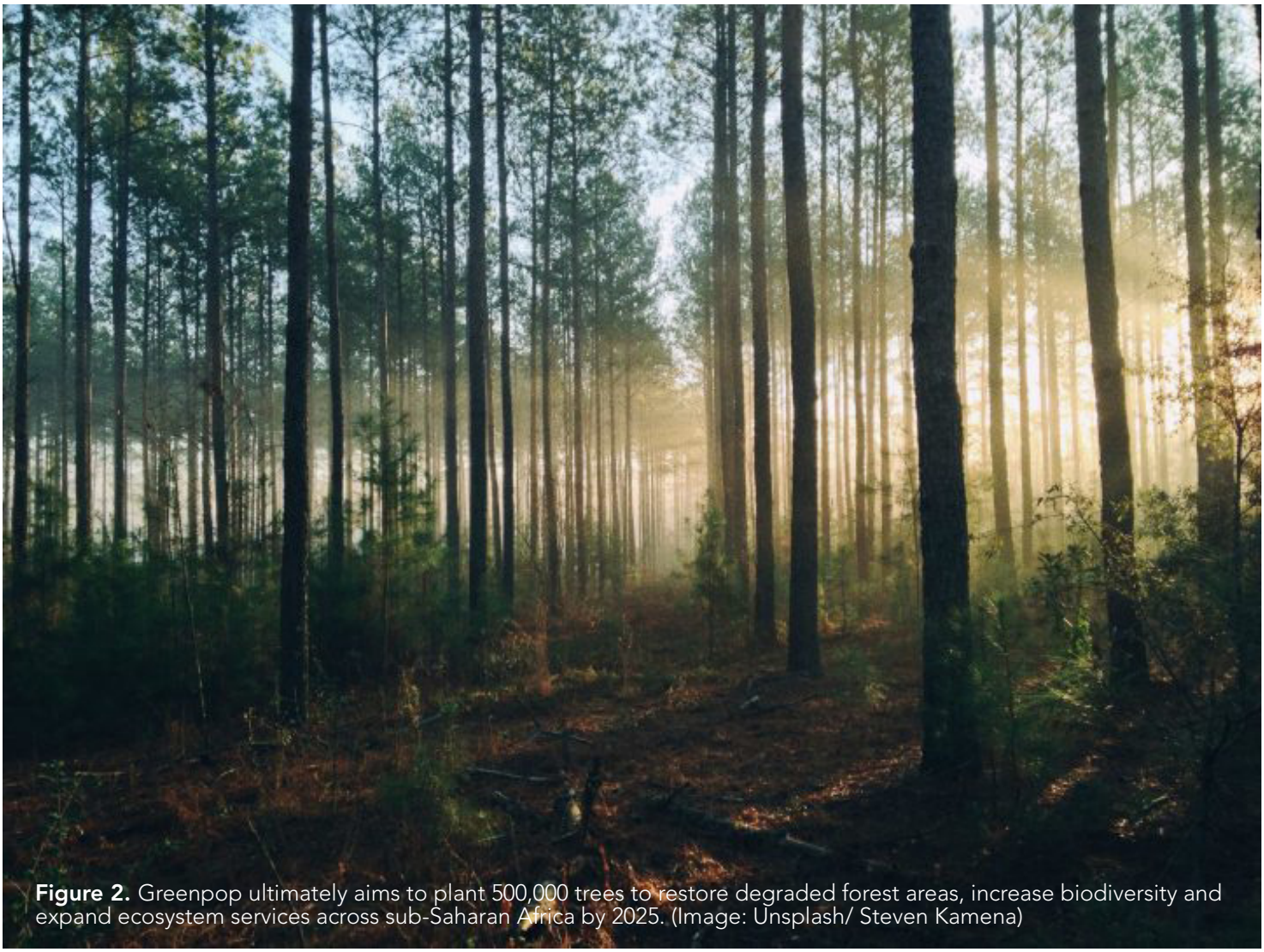

Figure 2. Greenpop ultimately aims to plant 500,000 trees to restore degraded forest areas, increase biodiversity and expand ecosystem services across sub-Saharan Africa by 2025. (Image: Unsplash/ Steven Kamena)

Figure 3: Bodhi Khaya Nature Retreat. (Image: Greenpop)

of the forest would take over the fynbos land and there is this kind of dance that goes on over the centuries," she explains.

Determining where the borders of forest and fynbos start and end in a mosaic area makes the restoration process more challenging, but by using as many resources as possible, from historical Geographic Information System maps, to talking to residents who have been in the area for a long time, Greenpop can get a good idea of what the area looked like before and how best to restore it.

"One of the things we also always look at as well are existing forests, the topography and patterns of growth in an area. In most of the places that we work there are existing patches of indigenous forest that have been conserved over time, so we often work on the edges of those forests," Gauld-Angelucci says.

"We also have to look towards the future and say, well, we are living in an age of climate change so we also need to be thinking about the fact that climates are going to be getting warmer and what vegetation is going to be sustainable in areas marked for restoration when it is one degree or 1.5 degrees hotter."

Platbos Forest Reserve restoration project

Greenpop has been working on a restoration project with the Platbos Forest Reserve in Uilenkraal Valley in the Overberg for 10 years. Platbos is an ancient indigenous forest – the trees are about 1,000 years old – as well as the southernmost forest in Africa.

Owners Francois and Melissa Krige began restoring the land 15 years ago when alien vegetation surrounding the forest began to pose a fire risk.

The Kriges did this by finding seedlings in the indigenous forest, growing them in their nursery and when they were old enough, planting the trees in the area cleared of alien vegetation.

Gauld-Angelucci says the Kriges recently finished clearing the alien trees from the indigenous forest after 15 years.

Greenpop came along in 2011 and started running festivals in Platbos every year, bringing in hundreds of people to help with the reforestation.

"For the most part Greenpop has been helping by filling in gaps in Platbos and have planted exactly 85,645 trees in that forest so far, including white milkwoods, white stinkwood, wild olives… all the indigenous trees that exist in the forest already, and we plant them in an interesting way: we dig pits and those pits get filled with mulch and the trees get planted around the pits in groups because that is the way the trees grow within the forest on their own.

"Generally, a tree will die, fall over and rot and then lots of little trees will start growing around it because the dying tree provides nutrients and an all-round conducive space to grow for the new trees, and we try to recreate that environment."

Grootbos Private Nature Reserve restoration project

Restoration is ongoing, so much so that Gauld-Angelucci hopes that Greenpop will be able to say that full restoration will be complete in 100 years.

"There is a lot of land left in that area to restore. There are a few other landowners and organisations in the broader Uilenkraal Valley landscape that have reforestation projects in the pipeline and we fully acknowledge that most of the valley is fynbos so we are trying to bring everyone together to come up with a consolidated strategy for the valley (what areas should be restored to forest and which areas should be restored to fynbos) moving forward so that we can be sure that we are not reforesting where we shouldn't be."

Paleoecology researchers from UCT are working on this, and heading the research is professor in plant conservation in the Department of Biological Sciences, Lindsey Gillson.

Gillson says they are using markers such as fossilised pollen and charcoal in soil samples to determine the ecological history of various sites in the Grootbos Private Nature Reserve, which is also in the Western Cape's Overberg region.

"While [global tree-planting drives] can have benefits if carefully planned and managed, there is also a risk that afforestation on ancient open, grassy and mosaic landscapes can be bad for biodiversity and ecosystem services."

Grootbos is a mosaic landscape comprising predominantly fynbos and only patches of forest, but Gillson says "forest restoration is nevertheless an important element in the management of Grootbos and so understanding the history of forest in terms of forest extent and composition is therefore important in guiding restoration that is ecologically appropriate".

In paleoecology (the study of the interactions between plants, animals and past environments), different indicators

are used to reflect the different parameters of environmental change.

"They are 'proxies' in that they are not direct reflections of past change but are linked to them," says Gillson. "For example, we can reconstruct changes in fossil pollen abundance and use this to infer changes in vegetation; in this case, the pollen is a proxy for vegetation abundance."

Paleoproxies can come from lake or wetland sediment, soil, and tree rings and include charcoal to indicate fire history, diatoms to indicate climate and dung fungal spores to indicate herbivory.

"In our lab, we collect sediment cores from wetlands and extract fossil pollen and other proxies from multiple points along the core to reconsruct change over time. We [use] AMS radiocarbon dating so that we can describe changes in vegetation relative to key environmental and social-ecological changes."

Why is this important?

While satellite imagery is commonly used to track rates of deforestation over time, Gillson says that sometimes the data do not go back far enough to define vegetation composition before intensive human impact, which means the risks of restoring a site with the wrong vegetation and doing more damage than good to an ecosystem are much higher in often well-intended, climate change mitigation initiatives like global tree-planting drives.

"While this approach [global tree-planting drives] can have benefits if carefully planned and managed, there is also a risk that afforestation on ancient open, grassy and mosaic landscapes can be bad for biodiversity and ecosystem services."

The paleoecology work Gillson and her team do can help to ensure this does not happen by comparing current with past forest extent. Although exact locations cannot be reconstructed from fossil pollen, they can compare changes in the relative abundance of forest and fynbos over time.

"What will be particularly important at Grootbos will be to see how extensive forests were before European settlement, when we know that timber harvesting might have led to depletion of forests," she notes. "We can also look at forest composition and help identify trees that might have been lost from current forests due to preferential harvesting of high-value timber."

Gauld-Angelucci adds: "The hope is that this research will add an additional layer of explanation onto the area and we can be that much more certain that what we are doing is the appropriate intervention."

The dangers of restoring a site with incorrect vegetation

Using the example of Grootbos, Gillson explains that while restoration of former forest patches would be ecologically valuable, expansion into former fynbos areas could threaten unique plants and is likely to be unsustainable because of the fire and water sensitivities.

"The drive to plant trees can damage the biodiversity of other ecosystems, for example, fynbos shrublands, grasslands, and mosaic landscapes that would naturally have been a mix of forest and non-forest patches. This is especially the case when non-native tree species are used. As well as taking up space, they can affect ecological processes like soil formation, hydrology and fire." By identifying the past forest extent and composition, as well as which open landscapes were ancient or man-made, can help guide conservation and restoration that includes a wider range of ecosystem types and is better for biodiversity and ecosystem services.

Figure 4. Tree-planting plans to offset carbon in the ancient grasslands (above) and everything it supports. (Image: Unsplash/ Tanya Paquet)

"Planting forests in the wrong place with the wrong species can be devastating for biodiversity, ecosystem services and communities."

Gillson also points out another danger of afforestation or restoring a site with the incorrect vegetation is the possibility of negative effects on carbon storage and other ecosystem services.

"If only above-ground carbon is calculated, planting trees can seem like a good option, whereas in fact more carbon is often stored in soils in most ecosystems (not tropical forests). The single-minded focus on carbon storage can also neglect other important ecosystem services such as water provision, grazing, and non-timber forest products that are often important to communities and livelihoods."

Carbon offsetting and planting trees to slow global warming

Deforestation is a huge global concern and most people are aware of the crisis and common deforestation examples such as the Amazon basin. They also understand there is an urgency to act on the climate crisis support for forest restoration as it appears to benefit both biodiversity and climate.

This, Gillson says, is the crux of the tree-planting frenzy, and the very important distinction between restoring forests (which have been destroyed by people) and planting new forests is getting lost.

"Planting forests in the wrong place with the wrong species can be devastating for biodiversity, ecosystem services and communities. Paleoecology offers techniques that can explore past forest extent and composition, but it is currently underutilised in restoration ecology."

Gauld-Angelucci points out that the main thing to consider in restoration projects is that the indigenous vegetation must never be replaced or "outcompeted" and that whatever is being added to the landscape needs to be supportive of the existing ecosystem rather than in competition with it – to avoid the danger of it overtaking and eventually killing the ecosystem – as is the fear with the AFR100 challenge which aims to fill 100 million hectares in Africa with trees by 2030.

"The risk of potentially damaging the naturally occurring ecosystems is something that is of primary concern to people working within the fynbos and grassland restoration and conservation space because trees get a lot of attention and I think there have been so many 'challenges' and 'pledges' with these tree-planting targets that I think people who are working in other types of conservation get nervous that trees are going to be planted all over the place which does not value the indigenous ecosystems that already exist."

Many companies, especially in the fast-fashion industry, have recently pledged to work towards "carbon neutrality" through large-scale carbon offsetting projects such as tree-planting initiatives or building wind farms. They include the Kering Group, the parent company of haute couture brands such as Gucci, Saint Laurent and Bottega.

Gillson says carbon offsetting allows entities that are emitting carbon to buy credits that are used to increase carbon storage elsewhere.

"For example, when taking a journey by plane, one can often now pay a carbon offset that allows the airline to contribute to a carbon storage project elsewhere."

While Gauld-Angelucci acknowledges that people can make choices that are more sustainable or less sustainable, she points out that we are living within systems that promote unsustainable behaviour and that carbon offsetting initiatives may be fine as a short-term measure, but not a long-term solution.

"There are so many things that go into a forest restoration project because a forest does not sit on a little island by itself."

"We actually have to take a look at the way our current industries are functioning and see where the changes can be made within those systems. It is not enough to 'offset the carbon by planting a tree', pat ourselves on the back and continue exploiting people and the Earth for profit – whole industries need to be tackled.

It really is not as simple as, 'let's just plant trees everywhere and we're going to solve climate change'."

Gillson agrees with Gauld-Angelucci that we need to tackle global heating with everything that we have.

"Carbon offsetting can be valuable if the carbon projects take account of all ecosystem services and the communities who depend on them, but radical changes are needed in consumption and production patterns if we are to meet global climate change targets," she says. "Carbon offsetting projects must consider biodiversity and ecosystem services, not just carbon storage."

Gauld-Angelucci adds: "What I find challenging is that people want a simple solution to what is actually quite a complex process and when they think of a tree being planted, all they think about is the tree and somebody putting it in the ground or a drone dropping a seed."

It is not that simple.

There are many moving parts involved in the restoration process, including communities, legislation that needs to be addressed and regular monitoring and evaluation to make sure the restoration process is working and sustainable. Gauld-Angelucci says "quick-fix" initiatives like tree-planting arise from the oversimplification of the narrative around environmental issues and what can be done about them.

"The thinking that you can plant a tree anywhere comes from not understanding or misunderstanding the basics of ecology and that specific species belong within specific ecosystems and that planting them outside of their relevant ecosystems can have bad effects; most people are not aware of this, especially because within our own back gardens there is a culture of picking out whatever you like and just planting it there, in your garden.

"There are so many things that go into a forest restoration project because a forest does not sit on a little island by itself; it is part of a broader landscape and it is basically development work and that is complicated and messy and expensive – but it is the most important, impactful work to do."

Why It's Worth Rewilding on a Domestic Scale

It doesn't take much to add some wildness to your garden at home.

Elizabeth Waddington

Current Address: Treehugger – Sustainability for All
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Rewilding will be crucial for tackling the twin crises of climate change and biodiversity loss. Most often, we talk about rewilding on a grand scale—on farms and large tracts of land, and in wider bioregions. But rewilding in gardens can be just as important.

There are many reasons why we should rewild on a domestic scale. It's useful to think small, in addition to taking the broader view since even small steps taken at home can help improve our environments. Thinking more "wildly" can help us find solutions for the major challenges we face.

Carbon Drawdown and Climate Change Mitigation

By replacing formal lawns, annual flower beds, and hard paving with trees, shrubs, and herbaceous perennials, we maximize photosynthesis and sequester more carbon in our gardens.

We should think about our gardens not plant by plant, but as living ecosystems where every element works holistically for the benefit of the whole, as in natu-

Figure 1. Rewilding in your own garden is just as important as rewilding on a grand scale to tackle climate change and biodiversity loss.

ral systems. By mimicking and working with nature, we can create thriving, abundant spaces which work for nature and deliver for us.

Thinking about carbon sequestration is crucial in any eco-friendly garden. In our own spaces, no matter how small, we can help tackle our climate crisis. In reciprocity for the gifts nature gives us, we have a responsibility to nurture vibrant natural systems in our gardens.

Water and Soil Systems

Rewilding is all about letting nature take the reigns. It is about working alongside nature to create systems that work for us and the planet.

Through careful garden design and minimal management, we can not only mitigate manmade climate change. We can also make more resilient systems, which can themselves adapt to the changes that will come. In turn, these will allow us to adapt more easily to our changing climate and the problems it will bring.

Wild spaces can be far more resilient in terms of water, aiding in adaptation to issues of drought or flooding. Soils in rewilded systems are healthier, too, with closed-loop systems in which surplus is returned to the system.

Choosing plenty of native plants helps save water, maintain and improve the soil, and keep nature's systems turning, both for the benefit of the whole and for us. An appropriate rewilding scheme can safeguard water supplies, protect against wildfires and other environmental disasters, halt ecosystem degradation, and make sure natural systems are in place that can themselves thrive, and which can help us to thrive, in the years to come.

Halting Species Decline

Life on Earth depends upon rich biodiversity of plant and animal species, and loss of that is a major issue. Human-induced climate change, pollution, and ecosystem degradation are leading to the loss of species at an unprecedented rate.

Rewilding in gardens is one way that we can begin to redress the balance. Loss of species is, of course, a tragedy in its own right; but we also need to understand that it poses a threat to us. Taking care of native wildlife in our gardens is one way for us to safeguard not only those species, but also our own futures. Species loss threatens food production, makes pests harder to control, and leads to a paucity in our environments. Letting wild and natural systems thrive in our gardens is important for our own resilience, and crucial for long-term sustainability.

Human Health and Wellbeing

In the modern world, there is a tragic disconnect between people and nature. Many studies have shown that human health and wellbeing suffers as a result. Bringing truly natural and "wild" systems into our gardens and our lives means re-taking our place not as something separate from the natural world around us, but as part of the whole.

A wild garden ecosystem helps us recognize the wonders of the natural world. It helps us to feel at peace, grounded, healthy, and happy.

When we see such rewilded systems up close, filled with native plant and animal species, we can derive many benefits for our physical and mental wellbeing.

Rewilding our gardens is not hugely complex. Small steps that we take to enrich our spaces can be rewarded in numerous ways.

Something like replacing a mono-species lawn with more biodiverse and resilient planting schemes can make a huge difference. Even allowing a "weedy" corner to emerge could be beneficial. Remember, rewilding can be as much about what you don't do as what you do. Letting nature take over a little can yield some huge rewards.

The above are just some of the main reasons why rewilding in gardens is something we should all be doing.

Red tape is choking biodiversity research in South Africa. What can be done about it?

[1]Graham Alexander, [2]Bryan Maritz and [3]Krystal Tolley

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It is no exaggeration to say that science has saved humanity on multiple occasions. The most recent has been through the development of vaccines for the current COVID-19 pandemic.

Not all scientists work directly on applied research such as vaccine development. But successful scientists produce the foundational data, information and knowledge that contribute to an upward chain of information. This improves our ability to comprehend and solve humanity's issues.

Given the indisputable value of science, it would seem foolish to obstruct its advancement. Yet impediments to advancements in some fields, such as biodiversity research, have been built over several years.

This is true in South Africa, where the burden of red tape has increased over the last decade, obstructing even some of the most basic forms of data collection. In a recent commentary, authored by more than 30 of South Africa's field and biodiversity researchers, we set out the scale of the problem.

The problem isn't particular only to South Africa. A groundswell of scientists views this state of affairs as a crisis. Scientists have been calling attention to the issue in Brazil as well as India, among other countries.

As field researchers, we acknowledge the need for regulations relating to the use of South Africa's natural resources for research and other purposes. Legislation is necessary for a host of legitimate reasons. These include preventing unethical practices, ensuring animal welfare, halting the unsustainable harvest of natural resources, checking the spread of notifiable diseases, and curbing the illicit wildlife trade.

But the implementation of the legislation in terms of legitimate research has become problematic because it is applied with a broad brushstroke approach. In essence, hunters, wildlife poachers and bona fide researchers are viewed through the same legislative lens. This inclusive approach supposedly reduces risks to natural resources. But it's also stopping, or holding back, genuine research intended to benefit conservation.

In our paper we call for measures to reduce the burden of red tape, and promote and facilitate biodiversity research in South Africa.

The tangle of red tape

For biological research, red tape comes mainly in the form of dramatically increased requirements for permits and clearances, causing biodiversity research to be heavily regulated. The result is that the critical need to collect data that relates to the future environmental sustainability and effective conservation of our environment is now overshadowed by a minefield of regulation.

South Africa has a number of pieces of legislation and accompanying regulations that directly affect field-based biological research projects. For example, researchers are required to get permits before they begin their work. But these can take months or even years to be issued.

Additionally, there are numerous overlays and duplications. Take the example of permits. Research programmes may require permits from national as well as provincial authorities. Given that a research programme may require permits for several activities, the application process can lead to long delays in projects getting off the ground.

In addition, broadscale projects conducted over more than one province require permits from each of the relevant provinces, each with its own permitting system and set of rules.

It's therefore not uncommon for some field-based research projects to require more than 20 different permits, clearances and approvals to be issued before work can commence.

In addition, we point to interpretations and implementation of older pieces of legislation that we don't believe mirror the spirit in which the laws were originally intended. In particular, we identify elements of the Animal Diseases Act and Veterinary and Para-Veterinary Professions Act.

In the case of the Animal Diseases Act, longstanding legislation has recently been reinterpreted so that it is now applied to all forms of field research on animals, even if the research work has no potential for spreading disease. And the Veterinary and Para-Veterinary Professions Act now regulates who is allowed to perform "procedures" on animals. This means that researchers must jump through additional administrative hoops annually to conduct their research.

The consequences for biological research are proving to be dire.

What needs to be done

If current levels of bureaucracy persist, we believe that the impact on biodiversity research in South Africa will be debilitating.

We highlight several relatively simple solutions. These include:

- Legislation should be assessed by an independent expert panel with input from researchers and legislators.
- Provincial and national permitting bodies should provide blanket research permits to accredited research institutions. Permission for individual research projects should then be devolved to each institution's ethics committee.
- Where permits are required for individual research projects, they should be issued for the expected duration of the project – not on an annual basis as is the current norm.
- Multiple separate permits should be replaced with a single integrated permit inclusive of all aspects of the relevant research in a research proposal.
- Permitting procedures should be streamlined. Turnaround times are far longer than promised and appear to be due to unwieldy systems and procedures.
- Clearance from an accredited ethics committee should be valid nationally.
- Universities and national research institutes should support researchers more directly, for example, with the provision of compliance officers familiar with the pertinent legislation to assist with compliance issues.

The progress of science needs to be facilitated – not hindered.

The government needs to adopt a more reasonable and fair interpretation of existing legislation so that scientific endeavour is facilitated and promoted, rather than impeded and blocked.

Figure 1. The banded rubber frog. Biodiversity research is heavily regulated in South Africa. (Photo by Robin Maritz)

Statistical ecology can unlock the power of biodiversity data in Africa

Henintsoa Onivola Minoarivelo, Francisco Cervantes Peralta and Timothy Kuiper

Current Address: University of Cape Town
Reprinted from: https://bit.ly/3oKQbsr

Africa boasts an immensely rich diversity of plant and animal species. These are the building blocks of healthy ecosystems. Yet, the projected loss of wild habitats and species on the continent threatens biodiversity. Recent reports by the Intergovernmental Panels on Biodiversity and Ecosystem Services and Climate Change also highlight how biodiversity loss and climate change threaten human well-being.

Good information is crucial to understanding and reversing this trend. More and more data about biodiversity is becoming available worldwide, through satellite imagery, citizen science programmes and wildlife rangers, for example. But socio-ecological systems are enormously complex and so data can still be sparse, biased, or incomplete. Not only must data be collected, it also has to be analysed if it is to be useful for decision making.

The emerging field of statistical ecol-

Figure 1. Statistical techniques are often used to show where poaching actually happens. (Photo by Wildsnap/Shutterstock)

ogy offers great promise to meet these challenges. This discipline uses growing datasets and innovative analytical methods to tackle important questions in biodiversity science and management. Statistical ecology offers opportunities for African researchers to develop local solutions to the continent's ecological challenges. It is currently a fast-developing field, even in Africa where it is led mostly by active research groups in South Africa.

Our aim at the centre for Statistics in Ecology, Environment and Conservation at the University of Cape Town is to answer important ecological questions using cutting edge statistical methods. The case studies below, in which researchers at the centre are involved, illustrate the potential of this exciting field.

Case studies of statistical ecology in Africa

The South African Biodiversity Data Pipeline for Wetlands and Waterbirds is a clear example of a project that can make an impact on conservation. This collaborative project led by the South African National Biodiversity Institute collates data from citizen science bird monitoring programmes to determine the state of waterbird populations and wetlands. Information about population trends and species distribution is critical for conservation managers. The project will transform raw data into usable indicators and display the results online for anyone to see. It has the potential to inform decisions and policies.

Statistical ecology can also help limit poaching. From rhinos and elephants to abalone and cycads, wildlife trade is a threat to African biodiversity.

A recent study by researchers analysed data collected by rangers to identify elephant poaching hotspots. Across the African continent, tens of thousands of wildlife rangers patrol wide areas every day, helping track biodiversity and threats to it. The challenge is that the locations of elephant carcasses they detect may reflect patrol patterns rather than true poaching patterns. The researchers used tailored statistical techniques to correct this bias and show where poaching was actually concentrated within their Zimbabwean study site.

Sometimes, researchers need to use refined techniques to gather reliable data, particularly when the species is difficult to detect. For instance, acoustic monitoring was used to keep track of the population of the Cape Peninsula moss frog. Researchers placed microphones at the study sites to record sounds from the environment. Then, they used automated sound recognition software to distinguish calls from the moss frogs. Frog abundance could be estimated from the frequency and location of calls using innovative statistical models. These imaginative procedures allowed them to monitor the population of this threatened endemic species without the need for specialist field staff.

Challenges and the way forward

Despite these promising examples, statistical ecology has yet to reach its potential in Africa. Large gaps remain in African biodiversity data, linked to limited local research funding and government support in many countries. Citizen science and remote sensing are exciting options for addressing these limitations at a relatively low cost, yet specialised skills are needed to analyse these data.

There is a promising trend of growing research and training in statistical ecology in Africa, but many institutions lack capacity and resources.

Researchers from the Global-North working on African systems should try to collaborate more meaningfully with African institutions to help address these gaps. This is critical to enriching the way data informs decisions in African biodiversity management and policy.

There's a unique opportunity next year to share knowledge, build capacity, and create a long-term collaboration network. Our centre in Cape Town is hosting the International Statistical Ecology Conference, a flagship event in the field. We encourage Africans working in this space to submit an abstract.

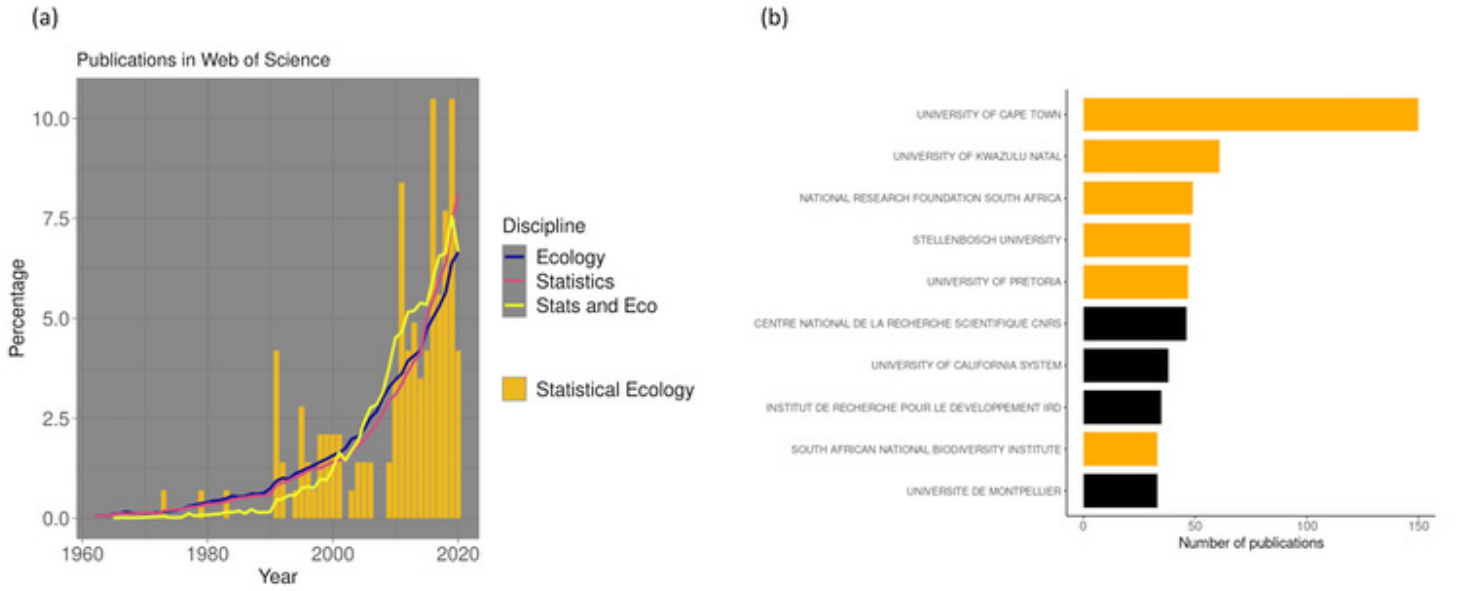

Figure 2. The recent development of the field of statistical ecology as compiled from Web of Science (a) per publications worldwide, and (b) per institutions working on African data. African institutions are shown in orange, although others have delegations in Africa. (by Henintsoa Onivola Minoarivelo)

Using Repeat Photography to Document Post Fire Change in Overberg Renosterveld

Overberg Renosterveld Conservation Trust

Current Address: Renosterveld

Reprinted from: https://bit.ly/3GAeJdl

It has been an incredibly busy spring for our Renosterveld conservation team. During the spring season the Renosterveld of the Overberg reaches its peak time to bloom, offering spectacular displays of bulbs, annuals and more in a plethora of different colours.

But for those who work tirelessly to conserve what little survives of the Renosterveld, the spring season is far more than the gorgeous flowers to be enjoyed in the field.

Spring is a season of biodiversity surveys and monitoring, particularly at the conservation easement sites where we work alongside landowners to support them in conservation and effective veld management as custodians of their Renosterveld. Last autumn we partnered with several easement landowners and other key conservation partners to effect successful ecological burns in areas of Renosterveld that had not burnt for many years. These ecological burns help to reduce the chance of wildfires by reducing fuel loads as well as rejuvenating areas of old veld.

Figure 1 - 9. The spring season is far more than the gorgeous flowers to be enjoyed in the field.

Figure 10. Ecological burns in areas of the Renosterveld that had not burnt for many years.

Figure 11. At Kykoedie the ecological burn was undertaken in collaboration with the ORCT.

The easement sites where ecological burns took place were Kykoedie, Uitvlucht and Napkysmond farms. Kykoedie farm encompasses some of the Overberg's largest intact areas of Central Rûens Shale Renosterveld while Uitvlucht and Napkysmond are in Eastern Rûens Shale Renosterveld.

At both Uitvlucht and Kykoedie, the veld age was estimated to be more than 20 years since the last burn had taken place. At Napkysmond the renosterveld to be burnt was estimated to be more than thirty years old post fire.

The Overberg Renosterveld Conservation Trust (ORCT) played a key role by applying for ecological burn permits for Napkysmond and Kykoedie. At Napkysmond the landowner was responsible for creating firebreaks and successfully implemented the ecological burn in autumn 2021.

At Kykoedie the ecological burn was undertaken in collaboration with the ORCT. The Uitvlucht burn was a collaboration between the landowners (the Streicher family), the ORCT, Enviro Wildfire Services and the Greater Overberg Fire Protection Association (goFPA) and their Working on Fire (WoF) team.

Once these ecological burns had successfully taken place, the next important job is to monitor the new growth in the Renosterveld, including which species are seen following the fire.

This work is done predominantly through the use of post fire vegetation surveys, but the ORCT also uses fixed-point repeat photography as a tool to examine post fire vegetation change.

Repeat photography is the process of taking a series of photographs at different times of the same view (marked by a permanent marker, such as a pole) while standing in the same position. It is a technique used by scientists and conservation professionals to document environmental changes over time.

Applications might range from mapping land cover change to document-

Figure 12. Repeat photography of the same view at different times.

ing incidents of plant poaching to, as in this case, undertaking post fire monitoring to document the rapid vegetation changes that take place in the Renosterveld following an ecological burn.

Following an ecological burn in senescent Renosterveld that is many years post fire, the thick shrubby overstorey vegetation is cleared, triggering the germination and blooming en masse of many annual plant species. Mass blooming of many bulb species is also a common phenomenon in Renosterveld the following spring after fire.

We still know relatively little about the fire ecology of Renosterveld vegetation, with monitoring of post fire changes in the vegetation helping us to grow our knowledge of the ways in which species or plant groups respond following a burn.

For example, some pollination guilds contain groups of plants with a certain flower colour that may only grow together after fire to attract a specific pollinator. Sometimes plant species new to science that only grow after fire in highly localised areas may emerge or species that have not been recorded for many years may finally reveal themselves. The more we monitor, the more we learn.

At Uitvlucht farm, the area of Renosterveld that was burnt is home to a small population of *Polhillia brevicalyx*, a small Renosterveld shrub in the pea family (*Fabaceae*) that is Critically Endangered on the Red List of South African Plants. It grows along drainage lines and in watercourses along the Ouka River – this is the only known remaining location for this species.

We hypothesised that one of the main threats to this species is a lack of fire, thus we decided to test this on a small proportion of the population. Following the successful implementation of an ecological burn in an area of Renosterveld at Uitvlucht where it grows, post fire surveys revealed that the original plants were resprouting successfully and numerous new seedlings were encountered growing in the vicinity – this is a great sign for the species!

As the Renosterveld continues to grow and change at these conservation sites, we continue to work alongside the landowners who are custodians to conserve and manage their veld. As our knowledge from ongoing biodiversity monitoring grows, we continue to feedback our findings to the dedicated landowners with whom we work.

We would like to acknowledge WWF South Africa Table Mountain Fund, WWF, Ford Wildlife Foundation, Hans Hoheisen and the Mapula Trust for supporting the ORCT's conservation easement project as well as the amazing farmers we are lucky enough to work with to conserve their Renosterveld. Please consider supporting the vital work of the Overberg Renosterveld Conservation Trust to help us manage and conserve more Renosterveld in perpetuity.

Figure 13. An ecological burn triggers the germination and blooming of many annual plant species.

Figure 14. *Polhillia brevicalyx*

Figure 15 - 26. Photos taken during an ecological burn performed in the renosterveld.

SAEON Fynbos Node launches the Global Overberg Renosterveld Watch application

Overberg Renosterveld Conservation Trust

Current Address: Overberg
Reprinted from: https://bit.ly/33hzk89

The Renosterveld of South Africa's Overberg is one of the world's most species diverse mediterranean type shrublands, but it is also one of the most threatened ecosystems worldwide.

Only around 5% of the original extent of this vegetation remains. One of the main threats is illegal ploughing due to expanding agricultural lands into the surrounding Renosterveld.

Research by Glenn Moncrieff and colleagues at the Fynbos Node of the South African Environmental Observation Network (SAEON) found that a total of 478.6 hectares of Renosterveld vegetation was lost to illegal ploughing from 2016 to 2020, representing a total of 0.72% of the remaining natural vegetation in the region.

With such a significant loss of Renosterveld over such a short time, an effective monitoring solution that can detect potential land cover change events such as illegal ploughing is needed.

Using a combination of satellite imagery and machine learning, Glenn Moncrieff and Marcel Gietzmann-Sanders have developed the Global Overberg Renosterveld Watch application, which starts to address this urgent need for an effective remote sensing solution that can be used to detect changes so that resources can be assigned as needed to start to tackle the problem on the ground.

The technology is developed based on the Global Forest Watch application, which uses Google Earth Engine and satellite imagery to document deforestation in Brazil. The satellite imagery which is used is now globally available, documenting land cover change around the world over several decades.

With further work and the application of machine learning to build algorhythms that teach the software to identify the differences between Renosterveld vegetation and transformed agricultural land, this technique can now be used to quickly identify illegal ploughing events within days of their occurrence.

Whenever new satellite imagery becomes available, these models can then be run to automatically highlight areas where land cover change may have taken place. At present, these models are being run every five days.
These changes in Renosterveld vegetation can even be detected prior to complete transformation has taken place. Often in areas where illegal ploughing is about to take place, the veld is brush cut.

This means that even these changes can be detected prior to the area being ploughed, which means that areas, where interventions are needed, can

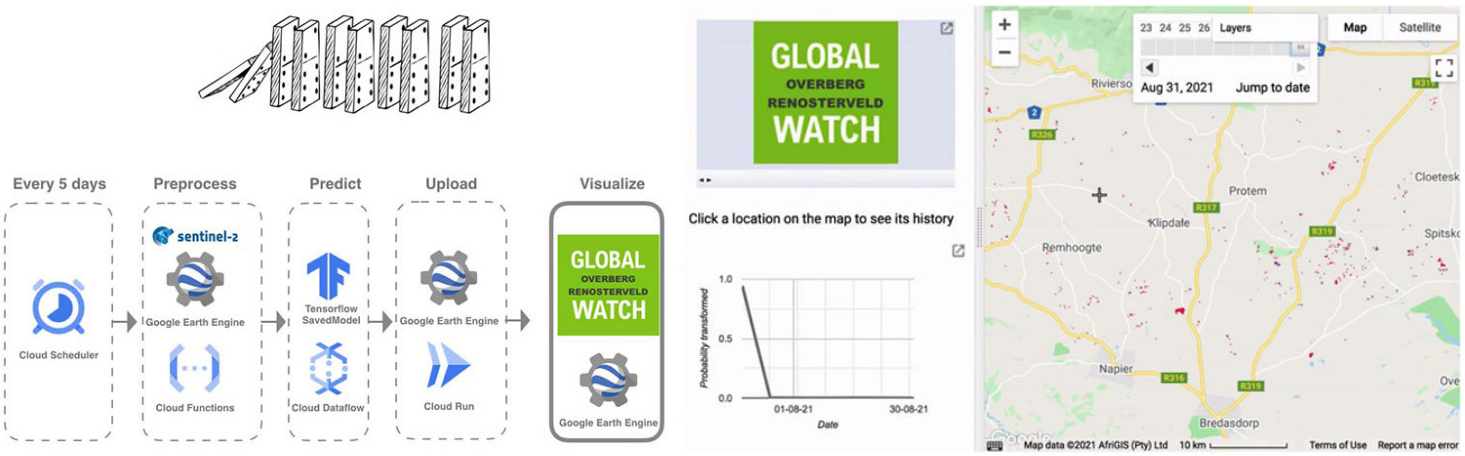

Figure 1. These models are being run every five days and can highlight areas where land cover change may have taken place. It is available online via cloud services.

Figure 2. One of the threatened *Polhillia* species in the foreground, with most of the population (and an entire habitat) ploughed up unlawfully.

Figure 3. Burning of veld is often followed by unlawful ploughing of the last remnants of Critically Endangered renosterveld.

be identified and targeted prior to the complete loss of the Renosterveld vegetation.

The Global Overberg Renosterveld Watch application is now available online via cloud services and can be viewed wherever there is an internet connection anywhere in the world. The application runs effectively and is extremely cost effective.

As these technologies become available and are further developed, it means that 'eyes in the sky' from satellite imagery can translate into people on the ground who are then able to target where monitoring of potential illegal ploughing events takes place.

This increases the likelihood of awareness among biodiversity professionals and enforcement of the occurrence of illegal ploughing events (a function of the *Department of Environmental Affairs and Development Planning*, as well as the *National Department of Agriculture, Land Reform and Rural Development*). No longer can Renosterveld quietly disappear piece by piece without anyone noticing patches of Renosterveld shrinking year by year or vanishing altogether.

This technology also has significant potential application in providing evidence for enforcement, so that it can be proven using data and imagery that land cover change has definitely taken place, as well as when it took place.

It is hoped that the Global Overberg Renosterveld Watch will play a significant role in slowing down the illegal loss of these highly biodiverse, threatened ecosystems.

Further Reading

Moncrieff, G.R. (2021) 'Locating and dating land cover change events in the Renosterveld, a Critically Endangered shrubland ecosystem', *Remote Sensing* (Volume 13): pp. 1-13.

GLOBAL OVERBERG RENOSTERVELD WATCH

Glenn R. Moncrieff
Marcel Gietzmann-Sanders

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These trees will soon be protected in SA – and disturbing them could land you in jail

Luke Daniel

Current Address: Business Insider SA
Reprinted from: https://bit.ly/3oMQRxp

Four more trees are likely to soon become protected in South Africa under the National Forests Act. Cutting, disturbing, damaging, or removing protected trees could land offenders in jail for up to three years.

The Minister of Forestry, Fisheries, and the Environment, Barbara Creecy, intends to add four more species to South Africa's list of protected trees. A government gazette published on Monday (8 November 2021) calls for public comment on Creecy's proposal.

"The species are proposed for addition to the existing list of protected tree species after evaluation by an expert panel, on the basis that they are keystone species and vulnerable to particular threats in specific parts of their distribution range," notes the gazette bearing Creecy's signature.

South Africa's list of protected trees currently contains 48 species, from the iconic Camel thorn, *Acacia erioloba*, to the Outeniqua yellowwood, and *Podocarpus falcatus*. Trees indigenous to dense forests in the Western Cape, to hardy species which dot the arid Namaqualand can be found on this list.

Now, four more trees are likely to gain their protection status.

Berchemia zeyheri, commonly known as Red Ivory in English, Rooihout in Afrikaans, and munia-niane in Tshivenda, is one such species that Creecy wants to be added to the list.

Red Ivory usually grows in dense groups with other trees, reaching 15 meters in height. It's evergreen to semi-decidu-

Figure 1. Left to right: *Berchemia zeyheri*, *Diospyros mespiliformis*, *Schinziophyton rautanenii* (Images: Wikimedia Commons) and *Umtiza listeriana* (Image: PlantZAfrica - SANBI, Creative Commons)

Figure 2. *Berchemia zeyheri* (Image: Wikimedia Commons)

Figure 3. *Diospyros mespiliformis* (Image: Wikimedia Commons)

ous and is commonly found in Limpopo, where, according to the South African National Biodiversity Institute (SANBI), its fruit is picked and sold on the street.

Wood from the tree has also been used to craft durable furniture, while its leaves and fruit are favoured by birds, bushbuck, and people alike.

Diospyros mespiliformis, better known as African ebony or jackal-berry, can grow 25 meters high, with a trunk circumference of 5 meters and dense evergreen canopy. It produces a fleshy oval fruit, yellow-green in colour, and is sought after by nyalas, impalas, warthogs, baboons, and hornbills.

Jackal-berry trees are found throughout Africa and, locally, are common on savannas or savanna woodlands, like the Kruger National Park, where they can be found growing on termite mounds.

The *Schinziophyton rautanenii*, best known as the Manketti tree or Mongongo nut, is not endemic to South Africa but can be found in northern Limpopo. It's a large spreading tree that usually grows to between 15 to 20 meters tall, with grey to pale golden-brown bark.

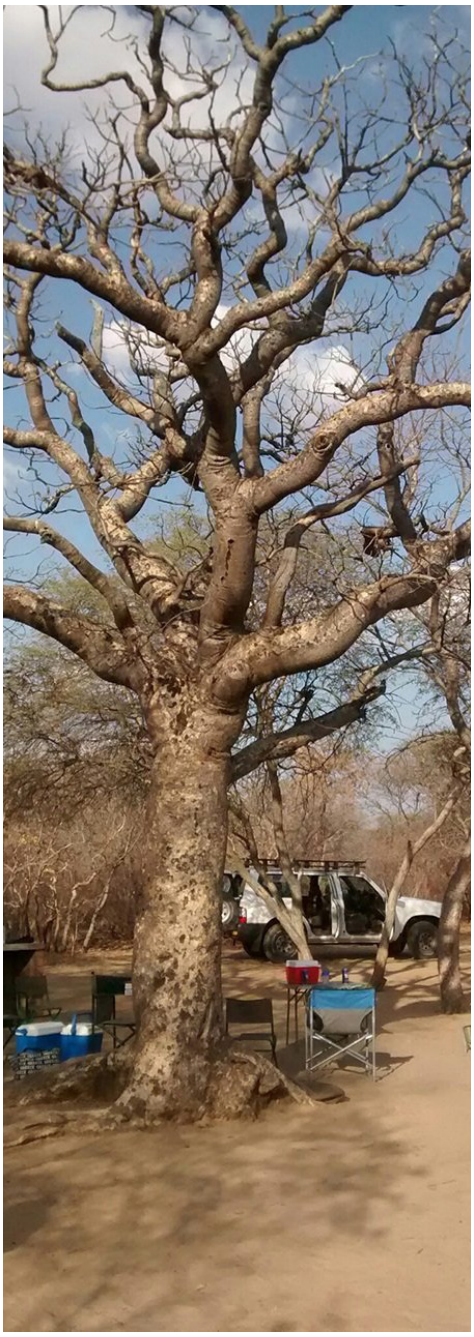


Figure 4. *Schinziophyton rautanenii* (Image: Wikimedia Commons)

The Manketti tree's light grey-green fruits are covered in velvety hairs, while its hard seeds produce an edible oil.

Umtiza listeriana, or simply Umtiza, localised and endemic to South Africa is found only in a small area in the Eastern Cape. Part of the legume family, this rare evergreen tree grows up to 12 meters and produces oblong leaves 20 to 60 mm long.
Umtiza also produces fruit that matures into brown and woody pods. It's found in the forested kloofs of the Eastern Cape, in the East London, Kentani, and King William's Town Districts. Rapid human expansion in these areas threatens Umtiza, with the species recently being restored in the Umtiza Nature Reserve.

"No person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree except under a license granted by the Minister," notes the gazette.

Anybody caught transgressing these laws could "be sentenced to a fine or imprisonment for a period of up to three years, or a fine and such imprisonment."

Figure 5. *Umtiza listeriana* (Image: PlantZAfrica - SANBI, Creative Commons)

Does Lightning Help Grass Grow?

Ethan Shaw

Current Address: Sciencing

Reprinted from: https://bit.ly/3GBSYKD

More than a few homeowners know the widespread belief that a thunderstorm results in greener grass. That may or may not be exactly true, but what's undeniable is that such a storm's electrical display does contribute to plant nutrition and thus helps to some degree with the growth of grass. The connection might seem hard to grasp – what does a flash of lightning contribute to the health of turf? – but it's actually fairly straightforward, and an example of one of the planet's fundamental, life-sustaining physical cycles.

Nitrogen Availability

Nitrogen is an essential nutrient for plants and other organisms, being a fundamental part of nucleic acids, amino acids and proteins, not to mention the photosynthesizing plant pigment called chlorophyll. It's also the single most abundant gas in the Earth's atmosphere, accounting for about 78 percent of its composition. (Oxygen is the second-most abundant atmospheric gas, at about 20 percent.) Despite that abundance, atmospheric nitrogen (N_2) isn't readily available to most lifeforms, basically because in this tightly bonded form it isn't very reactive with other molecules. Only a relative few living things – certain kinds of bacteria, including the cyanobacteria loosely referred to as "blue-green algae" – can directly use it as is. Other organisms require nitrogen to be transformed, or "fixed," into more reactive compounds such as nitrates (NO_3) or ammonia (NH_3) before they can use it for biological growth and processes.

Nitrogen Fixation and the Nitrogen Cycle

The process by which nitrogen is converted into a form usable to most organisms is called nitrogen fixation. The most significant pathway of nitrogen fixation is via the bacteria that can change the nitrogen molecule into nitrogen compounds such as ammonia. Some of these nitrogen-fixing microbes have symbiotic relationships with plant roots.

Atmospheric fixation is another way nitrogen gas can be transformed into nitrates and ammonia, and lightning is the means. Humans also artificially accomplish nitrogen fixation in the industrial production of fertilizers.

The conversion of nitrogen into biologically available compounds via fixation as well as other processes such as bacterial nitrification, and the release of nitrogen back into the soil and the atmosphere through organic decay and denitrification, create the nitrogen cycle, one of the core circuits defining the Earth's biosphere.

Lightning, aka Atmospheric Fixation of Nitrogen

The tremendous heat released by a bolt of lightning – some 50,000 degrees Fahrenheit, roughly five times the temperature of the sun's surface – can split apart a nitrogen molecule to free up two nitrogen atoms. A liberated nitrogen atom can then bond with oxygen atoms to form nitrogen oxides that, dissolving into raindrops, become nitrates. The lightning-freed nitrogen may also bond with atmospheric hydrogen to form ammonia. These soluble nitrogen compounds then fall to the Earth in rainfall, providing natural, lightning-produced fertilizer for grass and other plants.

When you consider that some 40 lightning bolts flash over the (mighty stormy) Earth every second, you get a sense of the significance of this atmospheric nitrogen fixation, even if it's overall less important than biological fixation. It's been estimated that lightning produces roughly 13,000 tons of nitrates each day around the globe.

Lightning and Greener Grass?

There's no question that lightning provides a source of nitrogen useful for growing grass. As to whether the grass will actually turn greener directly on the heels of a thunderstorm – well, that's a bit of a murkier connection.

Rainfall itself, whether associated with a cumulonimbus cloud or not, can result in a greener lawn given both the moisture it's providing and the nitrates and ammonia ultimately produced by lightning – though not necessarily locally – which will contribute to green-hued chlorophyll production. Heavy downpours from a thunderstorm may also simply wash dust off grass leaves, resulting in a lusher, more vibrant appearance.

(Reviewed by Sylvie Tremblay, MSc. Molecular Biology and Genetics)

In Memoriam: David Grossman

24/06/49 – 22/10/21

Mike Peel, Richard Davies, Elly Grossman, with inserts from many friends

Dr David Grossman was born on 24 June 1949, the older son of Phil and Fanny Grossman. Growing up in Sandringham, Johannesburg he completed his schooling at Northview High School, followed by the usual nine-month stint in the army. He registered for a BSc at the University of the Witwatersrand, majoring in Botany and Zoology, going on to do an Honours year and graduating in 1971. He excelled during these early years and his honours project was reworked into a published journal article. While at Wits, he was President of BioSoc and he met his future wife Elly, who he married in 1973. His introduction to conservation followed when he was appointed a Nature Conservator in the then South West Africa Department of Nature Conservation where he got to grips with the basics of "natuurbewaring" as it was practised at that time. This experience stood him in great stead: throughout his career, he set out to explore fully any project he dealt with, to understand all facets of the project from top to bottom, be it environmental, social and human so as to gain a full understanding of the interacting complexities thereof.

On returning to Johannesburg, he completed a Masters degree (*cum laude*) under the legendary Jo Grunow at the University of Pretoria in 1981. His topic dealt with herbaceous layer production in Burkea africana savanna. The study site was at Nylsvlei Provincial Nature Reserve, which became a vibrant research Mecca for postgraduates from far and wide. A PhD was completed in 1988, on factors affecting ranching in the North West Transvaal, a piece of work that became 'recommended reading' for students studying ecology. The PhD concluded at Wits rounded his academic qualifications and a new career as a civil servant began.

With game ranching recognised as a *bona fide* agricultural land use by the Department of Agriculture, David was tasked with setting up the game ranching unit, with Derek Berliner, Dutliff Snyman and Mike Peel as the raw new recruits!! As Derek remembers on his first day at the old "Departement Landbou" how pleasantly surprise he was to find his new boss with 'a ring of beads around his neck, copper bangles around his wrist and desk full of journals and natural history books scattered over his desk' – definitely anti-establishment. This small unit developed into GAPRU (Game Production Unit) at the newly formed ARC Grassland Research Center where David mentored and nurtured among others Berliner, both the Dutliffs Snyman and Smith, Richard Davies, Mike and John Peel, Slang Viljoen, Johan Pauw, Sean Petit, Graeme Montagu, Daan Buijs and many others. We left that wonderful phase in our careers much the richer both as ecologists and hopefully as people for David having been part of our development.

All too soon, in 1990 David left the formal agricultural sector and began a highly successful consulting career. There is insufficient space to cover all of David's projects but his work included game ranch assessments, working with provincial authorities including in the early days Bophuthatswana Parks (now North-West); in Namibia (Huab to Breslau, Epupa Hydro-electric Dam construction project where Chief Kapika, senior chief in the impact zone of the dam, gave David his personal wooden head rest as a token of esteem for the way in which David conducted dealings with the chiefdom, WWF Annual technical report for Namibia with Greg Stuart-Hill), Swaziland, Botswana (Khama Rhino Sanctuary and a demonstration game ranch in Ghanzi), Sabi Sabi, Peace Parks, the Lesotho Highlands Project, Mozambique (as the first consultant to visit after the civil war ended working in Banhine, Zinave, Limpopo National Parks), the Cradle of Humankind, Garden Route, Richtersveld and Kgalagadi National Parks, the list is long. With Eddie Koch, David investigated how nature conservation could be engaged for social justice and economic equality. They wrote a major paper on nature tourism and its contribution to the RDP for the South African Tourism Board (Satour) and produced the Background study to the South African White Paper on Tourism for *Department of Environment Affairs and Tourism*. David was a co-founder of *Mafisa Research and Planning* (MAFISA), which provides financial services to smallholder producers in the agriculture, forestry and fisheries sector.

Of his many international assignments, his collaboration with Michael Wells stands out. With Wells he produced among others an analysis of '*The economic and social contribution of protected areas in the new South Africa*' for the Land and Agriculture Policy Centre, Johannesburg. David was part of the core team that evaluated the pioneering global Millennium Ecosystem Assessment, with field visits to Brazil and the Caribbean. He contributed South African case studies to evaluations of the Critical Ecosystem Partnership Fund (2005) and of the NGO Flora and Fauna International (2016) and the mid-term review of the C.A.P.E. Biodiversity Conservation and Sustainable Development Project (2007). Michael describes David as the ideal evaluation partner: independent and principled, articulate, insightful, constructive, immensely knowledgeable, and never took himself or anyone in positions of authority too seriously.

Derek Hanekom, then Minister of Agriculture requested David with Phillipa Holden van Zyl to assess the Khomani-iSan and their land reclamation venture, an estimated six month undertaking

that ran to some 17 years!! It was to be the best of times and worst of times in David's life. It thrilled his intellect and sapped his health, he revelled in the oral traditions he encountered and despaired at the political and social forces ranged up to thwart the cultural sensitivities he sought to preserve. Ultimately, David was shyly proud of the community-run, commercial game and hunting ranch that emerged from his efforts and which remains to date, the only current example of a successful historical land claim in southern Africa.

The breadth of David's mentorship is particularly noteworthy, giving guidance and job shadow opportunities at schools and providing lifetime memories. Along the way, David quietly supported many deserving youngsters and oldsters as well. He paid for cataract surgery, covered the tuition fees for nature conservation students and as Elly says, 'gave bits and pieces all over to those in need. He never told me most of it, because he knew I would be cross'.

David was active in the GSSA and contributed immensely in getting ecology on the map within the GSSA. He served as vice president in 1990/91, president in 1991/1992 and immediate-past president in 1992/1993. In his Presidential address, he declared himself President in perpetuity!!

David had an amazing sense of adventure and wonderment about everything natural, wherever it was: be it the Brazilian rain forest, a sacred American Indian pool in the USA, the Seychelles at the Val de Mai heritage site and all over in Africa. I remember him describing a visit to the Cunene River as being deeply spiritual. The place spoke and he heard.

His adventurous spirit and wicked sense of humour is legendary and we recall some incidents here.

Surrounded by lions in our tents in the Sabi Sand Wildtuin, David outsprinting my brother John and I to the car and then locking the door with us on the outside;

Leaving a bit late in the day to fly to Messina experimental farm and David navigating on a 1:250 000 map by lighter to make sure we cleared the Soutpansberg and then a slight miscalculation as we soared over the Limpopo into Zimbabwe (a not so friendly country at that stage);

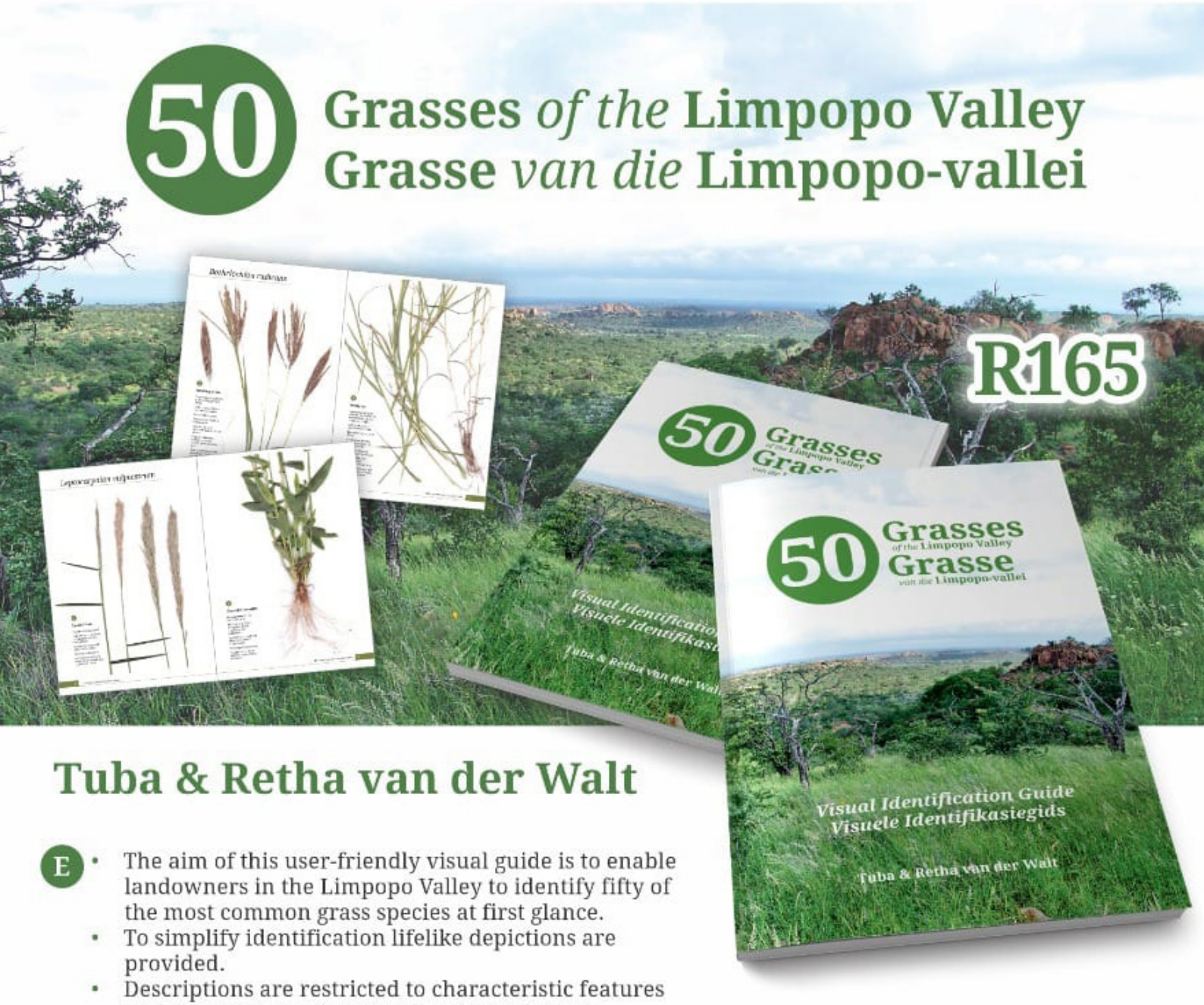
Elly remembers coming home from work one day to find all the bean bags and cushions in the lounge removed. He used them in the back of the red bakkie so that the three boys job-shadowing Dave could make themselves comfy on the five day expedition. They came back rather the worse for wear, the bean bags and cushions that is!

Elly, thanks for keeping David on the straight and narrow and for sharing him with us. A big tree has fallen.

David leaves his wife Elly, the constant in David's life and who he loved so dearly, thank you for sharing him with us, brother Jonathan and the extended Grossman, Kaales, Henton, Nathan and Mill families.

Figure 1. David Grossman (left) with friends he made along his fruitful career.

50 Grasses *of the* Limpopo Valley
Grasse *van die* Limpopo-vallei



Tuba & Retha van der Walt

E

- The aim of this user-friendly visual guide is to enable landowners in the Limpopo Valley to identify fifty of the most common grass species at first glance.
- To simplify identification lifelike depictions are provided.
- Descriptions are restricted to characteristic features of the specific species as well as its ecological significance.
- Grasses that can be confused with one another have been grouped together.

A

- Die doel van hierdie gebruikervriendelike visuele gids is om grondeienaars in die Limpopo-vallei in staat te stel om met die eerste oogopslag vyftig van die mees algemene grasspesies in die area te identifiseer.
- Identifikasie word vergemaklik deur lewensgetroue afbeeldings.
- Beskrywings is beperk tot enkele kenmerkende eienskappe asook die ekologiese waarde van die betrokke spesie.
- Grasspesies wat met mekaar verwar kan word, is saam groepeer.

Book specifications
Boek spesifikasie:

- Full-colour, soft cover format
- Volkleur, sagteband
- 210 x 297 mm (A4)
- 112 pages / 112 bladsye

ISBN: 978-0-620-97165-2

Text in both English and Afrikaans
Teks in beide Engels en Afrikaans

ORDER/ BESTEL: Retha van der Walt
Email: ludwigslust@xnets.co.za, Whatsapp: 078 5366 478, Tel (H): 079 209 6233

Upcoming events

15 – 17 February 2022

Course on Grass Identification

Africa Land-Use Training presents a grass identification course from 15 – 17 February 2022 the ALUT training farm, Modimolle. For more information or bookings email us at courses@alut.co.za or complete the information request form on our website at www.alut.co.za.

14 – 16 March 2022

Carbon Farming, Soil Conservation, New Technologies Conference and Field-Day

The conference will feature a series of presentations, discussions, case studies and a field day on topics scaling regenerative agriculture and conservation practices, soil health research, collaborative conservation and fostering the whole agrarian lifecycle. The conference will be held at the Stellenbosch University, Cape Town. Contact Ryan Jagesar at ryan@empiretraining.co.za or visit Carbon Farming, Soil Conservation, New Technologies Conference and Field-Day 2022 (bizcommunity.com) for more information.

30 – 31 August 2022

International Conference on Rangeland Ecology and Research

The ICRER 2022:16 aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Rangeland Ecology and Research. It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Rangeland Ecology and Research. The conference will in Kuala Lumpur, Malaysia. Visit International Conference on Rangeland Ecology and Research ICRER in August 2022 in Kuala Lumpur (waset.org) for more information.

5 – 9 September 2022

MEDECOS Conference XV

We are pleased to confirm that we will be hosting MEDECOS2022 from 05-09 September 2022 and that we are planning the conference as a hybrid event! This means that it will be possible to join us in person or virtually for MEDECOS2022 – Partnerships for Global Change! Visit Medecos2022 (medecos2020.org) for more information.

If you would like to advertise your upcoming event, please contact us and we will include it in our next edition.

Go check out the following

Websites, Webinars & Podcasts

Dr. Elaine's™ SOIL FOOD WEB SCHOOL

Dr. Elaine Ingham has advanced our knowledge about the soil food web for over 4 decades. Widely recognized as the world's foremost soil biologist, she's passionate about empowering ordinary people to bring the soils in their community back to life. Dr. Elaine's™ Soil Food Web Approach has been used to successfully restore the ecological functions of soils on six continents. The courses offered by Dr. Elaine's™ Soil Food Web School have been designed for people with no relevant experience – making them accessible to individuals who wish to retrain and to begin a meaningful and impactful career in an area that will help to secure the survival of humans and other species.

Visit: https://www.soilfoodweb.com/

Johannesburg Succulent Society

The objectives of the Johannesburg Succulent Society are to promote knowledge, the cultivation and propagation of succulent plants, and to contribute towards the protection and conservation of all indigenous plants in their habitats.

Visit: www.joburgsucculentsociety.com

Conservation Conversations with BirdLife South Africa

These weekly webinars hosted through Zoom will hopefully bring some entertainment and education to your household as we embrace the new virtual reality that we all find ourselves in thanks to the restrictions brought on by the recent COVID-19 pandemic. Each talk will last approximately 45 minutes to an hour with a 15-30 minute Q&A session with our presenters afterwards. These sessions will give you a chance to learn about the incredible conservation work taking place across South Africa and beyond while also sharing some of the conservation success stories which BirdLife South Africa has been privileged to drive.

Visit: https://www.birdlife.org.za/blsa-conversations/?fbclid=IwAR0OphkAK1Omx5vxSu2omJfBI1fHIAaZoEnBwAF7d9PMoEWF3bJZ61pQusc#1622816346779-1e6331a3-6b23

The Art of Range

The Art of Range is a podcast about rangelands for people who manage rangelands. The goal is education and conservation through conversation.

Find us online at www.artofrange.com

Go check out the following

Websites, Webinars & Podcasts

Utilising livestock in the rehabilitation of grazing in the wildlife industry

Gerry Weber, CEO of Green Bio (www.greenbio.co.za) speaks to Johan Bouwer, co-founder of the Herding Acadmey near Graaff Reinet in South Africa about the lost art of herding animals. The herding academy is a holistic learning centre where the ancient skill of herding animals is being applied within a holistic decision making framework to regenerate the landscape. The lost art of herding animals is once again being brought to life by trained professionals and herders, using livestock to mimic the herd migration effect of the once ancient wild herds roaming our ecosystems.

Watch it at: https://youtu.be/5JentqnQ0SE

Restoring Grasslands – Rewild

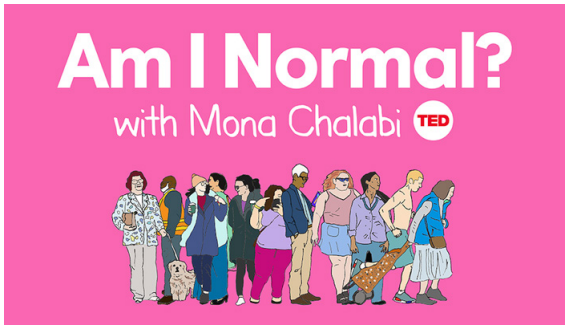
Grasslands are amazing—they're basically like upside down rainforests because of their ability to store TONS of carbon. They also serve as critical habitats to key species. In this video, part of our series of explainers honoring the kickoff of the UN Decade on Ecosystem Restoration, we talk more about grasslands and our work with partners Snap and the National Park Service to restore native plants and grasses. Let's #rewild the world!

Watch it at: https://youtu.be/ptM3zwSrPIA

What we miss when we focus on the average – Mona Chalabi, TED

It's tempting to focus on averages when we think about data, but the world is a lot messier than those numbers can make it out to be. So what could we gain if we shifted our attention to the outliers in the data, or as data journalist Mona Chalabi likes to call them, the lost birds? Want to hear more from Mona? Check out her podcast Am I Normal? with Mona Chalabi, from the TED Audio Collective.

Watch it at: https://www.ted.com/talks/mona_chalabi_what_we_miss_when_we_focus_on_the_average?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare



Deadlines for

Newsletter of the Grassland Society of Southern Africa

Grassroots

submissions 2022:

Issue 1: 01 February 2022

Issue 2: 01 May 2022

Issue 3: 01 August 2022

Issue 4: 01 November 2022

Please visit
www.grassland.org.za/publications/grassroots/submit-to-grassroots-now
for submission guidelines.

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