

When the Pacific Ocean Reaches the Lowveld: What This El Niño Means for Us in the Greater Kruger



Mark Bishop

I know that I have harped on this subject before but if you have felt the news drumbeat about a “super El Niño” and wondered what it actually means for Hoedspruit, here is the honest answer. As of now, our dams are full, our soils are wet, and the drought everyone is talking about has not arrived. The El Niño is real, it is strengthening, and it is likely to make the coming summer hotter and probably drier than usual - but the Lowveld enters this event from a position of unusual strength, and preparation now matters far more than alarm.

El Niño is the warm phase of a natural Pacific Ocean cycle called the El Niño–Southern Oscillation (ENSO). Every few years, the trade winds that normally pile warm water up in the western Pacific slacken, and a vast pool of warm water sloshes eastward toward South America. That shift in ocean heat rearranges rainfall and wind patterns across the entire planet - including, eventually, over southern Africa. Crucially for us, ENSO only meaningfully influences South Africa during the summer months. During winter, our weather here is driven by other systems entirely, which is why this El Niño has had almost no bearing on

the dry, sunny winter we have just experienced.

Two things make the 2026 event genuinely notable, and worth teaching rather than just fearing. First, its potential strength. The Japan Meteorological Agency was the first major agency to declare El Niño's onset, and the US NOAA Climate Prediction Centre (CPC) followed by upgrading to an “El Niño Advisory” on 11 June 2026, confirming the pattern was present rather than merely forecast. By its August update, the CPC put the odds of the event reaching “very strong” intensity during the coming Northern Hemisphere fall and winter, at

greater than 90%.

What Does This Mean?

To put numbers on it: the Australian Bureau of Meteorology reported the relative Niño-3.4 index at +2.20°C for the week ending 9 August 2026, well above the +0.80°C El Niño threshold. Forecasters expect the event to peak around the turn of the year and persist into 2027. A “super” or “very strong” El Niño is generally defined by central-Pacific sea-surface temperatures more than 2°C above normal - a level reached only a handful of times, in 1982/83, 1997/98 and 2015/16.

Cont. on page 3



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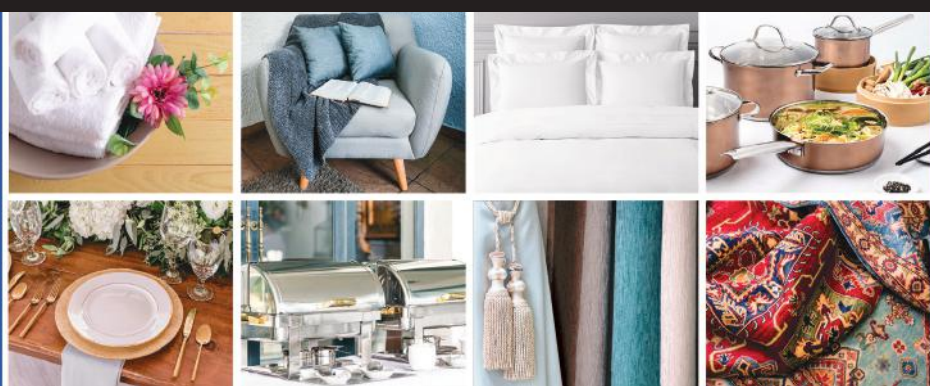


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LOCALS ONLY

Everything But the Kitchen Sink

Luca Tooley and Safari Wines, Ultra Liquors and Moriah Foods - keeping the Lowveld stocked, one delivery truck at a time.

What is your business name and what does your business do?

Safari Wines/Ultra Liquors and Moriah Foods. We are wholesalers and distributors of wine, liquor, beverages, food, Coca-Cola products, cleaning products, consumables and just about everything else our clients need, servicing Hoedspruit and the greater Kruger area.

How long have you been operating in the Lowveld, and what brought you here originally?

I've lived in Hoedspruit for three years, but I've been doing business in the area for around 10 years. Purchasing Safari Wines is ultimately what brought me here permanently.

What's the hardest part of operating here that businesses in larger centers

don't face?

Logistics. We cover huge distances, suppliers don't deliver here as frequently as they do in the bigger centers, and keeping the right stock available can be challenging.

What does the Lowveld economy get right that the rest of South Africa could learn from?

There's a real sense of community here. People tend to support businesses where they know the owners and the people behind them. There's also an understanding that supporting local businesses ultimately supports the whole community.

What are you watching closely in your sector right now - locally or continentally?

Diesel prices are always important when you're covering the distances we do. On the wine side, we're watching how climate change is influencing what gets planted and produced in South Africa. We also keep an eye on new trends in wine, liquor and beverages. We're always looking for what's next.

What's the one thing you wish your customers understood better about what you do?

That we have some of the best wines in South Africa sitting right here in Hoedspruit. We know the products we sell, particularly wine,

and we're always willing to help our clients find what works for them and make their lives a little easier.

What does your business contribute to the Lowveld beyond the transaction?

We try to be part of the community rather than just do business in it. We contribute to conservation initiatives, support Farm Watch where we can, help local schools with donations and try to get involved wherever we can make a difference.

How far and wide do you offer your services?

We deliver throughout the greater Kruger area, including Phalaborwa, Hazyview, the Sabi Sands and surrounding reserves, as well as Tzaneen and Haenertsburg.

New enquiries must be directed to:

Luca Tooley, 015 004 0579, warehouse@safariwines.co.za, luca@



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Cont. from page 1

Second, this event developed unusually fast. The Niño3.4 index - the main measure of Pacific warming used to track El Niño - crossed the El Niño threshold in April 2026, then climbed to 1°C by May and 1.6°C by June: one of the fastest onsets in the observational record, according to climate analysis site Carbon Brief. By early July it had already exceeded 2°C, far outpacing how quickly previous El Niño events have developed.

One important nuance that rarely makes headlines: forecasters stress that the strength of an El Niño does not directly determine its impact here. Dr Neville Sweijd of Stellenbosch University's School for Climate Studies has cautioned that a stronger El Niño does not automatically translate into more severe impacts, because other ocean and atmospheric systems can amplify or dampen the effect. A strong signal in the Pacific does not guarantee a severe drought in the Lowveld.

What Impact Will That Have on our Region

Here is where careful reading matters. The South African Weather Service's seasonal guidance, presented by forecaster Lungile Makondo in early August 2026, points to a greater than 95% probability of El Niño, with above-normal rainfall still expected for the August-to-October window, but the drier El Niño signal expected to spread across the summer-rainfall region - including Limpopo and Mpumalanga - from around October to December 2026. Both minimum and maximum temperatures are forecast to stay above normal right through the August-to-December period.

In plain terms: forecasters currently

expect a hotter-than-normal summer with high confidence, and a drier-than-normal summer with lower confidence. Sweijd has made this distinction explicitly - there is greater confidence in the above-average temperature forecast than in the rainfall forecast. And climate change raises the stakes on the heat side: as Sweijd puts it, global warming lifts the "platform" onto which El Niño adds its extra warmth, so the two effectively "exaggerate each other." Agricultural meteorologist Johan van den Berg's assessment is that the 2026/27 summer is likely to bring more heat stress for plants than pure drought stress - a subtle but important difference for local farmers.

It is also worth flagging what is still uncertain. As of 23 August 2026, whether this becomes a true "super El Niño" and exactly how the rainfall plays out over the Lowveld has not been settled. These are forecasts and probabilities, not guarantees.

Full Dams and Wet Soils

This is the part of the story that national coverage misses entirely. The Lowveld is not entering this El Niño parched - quite the opposite. The 2025/26 wet season was so wet that in January 2026 the region suffered its worst flooding since 2012, with the Department of Water and Sanitation (DWS) reporting that 14 of Limpopo's 19 monitored dams exceeded 100% capacity, and floods around Hoedspruit and Kruger claiming lives and washing away the critical Zandspruit/Sandspruit bridge on the R527.

Those floods left a silver lining that matters enormously now: our storage is brimming. The Blyderivierpoort Dam (the "Blyde Dam") on the Blyde River near Hoedspruit - which feeds the Blyde River Irrigation District supplying local citrus and mango farms, and water to Phalaborwa - stood at 100.5% of capacity as of 17 August 2026, according to DWS's weekly State of Reservoirs data. That is 5.1 percentage points higher than the same week a year earlier, when the dam was at 95.4% - meaning this year's buffer going into summer is meaningfully stronger than last year's. Going into a potentially dry summer with that reservoir full is about the best insurance the district could ask for. Provincial averages remain high too: Mpumalanga at 98.4% and Limpopo at 98.9% as of early August 2026.

What it Means for Farming, Wildlife and Lodges

Citrus and mango farmers around Hoedspruit are unusually well positioned. Both crops here are grown under irrigation, and the dams that feed them are full. That said, El Niño heat carries specific risks worth understanding: research published in the journal *Horticulturae* in 2026

found that severe water stress in citrus produces fruit that is "dramatically smaller and lighter" and more acidic, and therefore less marketable, while mango - though relatively drought-tolerant - can see reduced fruit size and increased early-season fruit drop under water stress. The lesson from science is that moderate water management can even improve fruit quality, but severe stress cuts both size and marketability. With full dams, local growers have the buffer to avoid the severe end of that spectrum, provided they manage irrigation scheduling tightly through the hot months.

The national agriculture picture reinforces the "buffer" theme. South Africa has just harvested a record maize crop - the Crop Estimates Committee placed the 2025/26 summer grain and oilseed harvest at a record 21.49 million tonnes, with maize at 17.25 million tonnes, the largest on record. As Agbiz chief economist Wandile Sihlobo has repeatedly noted, ample carry-over stocks and improved soil moisture mean the country's food security is not under immediate threat - the risk is to the 2026/27 crop planted from October, and it would show up in food prices mainly during 2027. Dryland grain farmers in the wider summer-rainfall region are the most exposed. As Sihlobo has documented, the last comparable El Niño showed how quickly this can bite: "during the 2023-24 season, when a mild mid-summer drought occurred, South Africa's maize harvest fell by 22% from the previous season to 12.9 million tonnes."

Wildlife and the reserves face a more complex picture, and here the Greater Kruger has a genuinely interesting management story. Early management in the Kruger National Park supplemented natural water sources with roughly 365 artificial waterholes and about 50 earth dams from the 1930s onwards, intending to increase herbivore numbers and buffer them against drought. But following a revision of its water policy in 1997, the park closed about two-thirds of those artificial waterholes. Counter-intuitively, research found that too much artificial water damaged biodiversity: it caused an overabundance of water-dependent species such as impala, elephant and zebra, and squeezed out drought-tolerant rare antelope like roan and sable, while concentrating grazing year-round and degrading the veld. Studies of the severe 2015/16 drought concluded that wildlife deaths came mainly from lack of forage, not lack of water - and that artificial water points played a minimal role in sustaining populations through drought.

The practical upshot for game farms and the Associated Private

Nature Reserves (APNR) - the roughly 180,000-hectare cluster of Timbavati, Klaserie, Balule, Umbabat and Thornybush reserves whose fences with Kruger were removed in 1993 - is that a dry El Niño summer is, ecologically, a natural part of the savanna cycle rather than a crisis to be pumped away. That said, the APNR reserves manage their own water and have historically differed from Kruger on supplementation. Reserve managers watching this season will be balancing tourist expectations of animals at waterholes against the ecological case for letting the system dry down naturally. After two very wet years, the veld carries a lot of grass - good forage now, but also fuel for fire as it dries, a point risk analysts have flagged nationally.

Lodges and tourism should note two things. First, the dry season is peak game-viewing season precisely because animals concentrate at remaining water - a hot, dry summer can actually make for excellent sightings. Second, most lodges rely on boreholes, and a strong El Niño combined with high evaporation (Lowveld summer temperatures regularly exceed 35°C, and Hoedspruit can reach into the 40°C's) can draw down groundwater. Full surface dams do not automatically mean full aquifers, so borehole-dependent operations should monitor their yields.

The Economic Backdrop

The South African Reserve Bank (SARB) has explicitly flagged El Niño as a risk. In its May 2026 Monetary Policy Committee statement, the SARB modelled a scenario in which El Niño-driven drought pushes food and inflation higher, keeping interest rates higher for longer. Governor Lesetja Kganyago put it directly: "With El Niño added, rates stay high for longer. The most adverse scenario puts all the risks together, causing inflation to peak above 6%, requiring three extra hikes." By August, Kganyago reiterated that while food inflation had so far remained contained, El Niño and elevated fertiliser costs still posed upside risks. For Lowveld households, the takeaway is that any food-price effect is more likely to be felt in 2027 than in the next few months.

The Lowveld has weathered far worse from a far weaker starting position. Full dams, wet soils, record grain stocks and a landscape that is, in many ways, built to handle dry summers give this region real resilience. The sensible response to this El Niño is not fear - it is a full water tank, a serviced borehole, a fire plan, and an eye on the forecast.

Can we shy away - not by any means. Expect the onslaught but know that we are in a good resilient position.



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Five Years of Silence - Who is Assessing the Assessors of SA's Environmental Future?

THIS IS S.A.

Tony Carnie

While legal and engineering bodies publicly log disciplined members, South Africa's environmental assessment regulator faces questions over years of silence regarding professional misconduct and sanctions.

The Legal Practice Council is responsible for investigating complaints and recommending the suspension or striking off of attorneys and advocates for malpractice. The Engineering Council of South Africa also has procedures to ensure professional service and ethical behaviour from engineers, with the outcomes of disciplinary action published in the Government Gazette.

Similar principles apply to members of the Environmental Assessment Practitioners Association of South Africa (Eapasa). This is the official registration authority for roughly 2,600 private and state-sector professionals charged with assessing and approving mandatory environmental impact assessment (EIA) studies.

But while the results of disciplinary inquiries involving errant lawyers or engineers are published for all to see, Eapasa has maintained a curious silence on this issue.

For five years, Daily Maverick has been asking Eapasa for a list of the environmental practitioners who have been fined, suspended or expelled from the association for misdemeanour or ethical breaches since its official establishment roughly 14 years ago.

The response to our questions in May 2021?

Not a peep.

More recently (on 23 June), we sent the same questions to Eapasa following the election of its new board, now chaired by Durban-based practitioner Sabelo Nkosi.

The Questions

Since the establishment of Eapasa in 2012, how many formal, written complaints has the association received against its registered member practitioners/candidate practitioners for alleged misconduct or breaches of the Eapasa Code of Ethical Conduct and Practice?

Of these complaints, how many were referred to the Professional Conduct Committee (PCC) for a formal inquiry?

How many complaints were upheld by the committee; how many were dismissed and what sanctions/measures were applied in respect of the complaints that were upheld?

Does Eapasa wish to comment on the possible reasons why so few com-

plaints appear to have been lodged with or upheld by the PCC?

Eapasa's Registrar and CEO, Dr Patrick Sithole, acknowledged receipt of our queries on 2 July, but nearly two months later, the association has not provided any responses, despite follow-up requests. Nor is there any visible evidence of practitioners being sanctioned on the Eapasa website.

Why are Answers to These Questions Important?

In many respects, environmental assessment practitioners (EAPs) can be considered to be the custodians of a sound and sustainable environmental future for South Africa.

Their broad responsibility includes the planning, management, coordination or review of environmental impact assessments (EIAs), while public sector practitioners are responsible for scrutinising these assessments and drafting authorisations.

As such, they exercise significant influence and power in advising the government on whether to approve, modify or refuse projects with potentially negative environmental impacts.

Tony-Eapasa

Environmental impact studies can play a crucial role in protecting threatened or rare species, such as the African pangolin. (Photo: Neil Aldridge for African Pangolin Working Group)

Though private sector EAP consultants are paid directly by applicants for their professional services, they are required to act independently "even if this results in views and findings that are not favourable to the applicant".

The declarations signed under oath by EAPs are legally binding documents, confirming their independence, professional registration and commitment to providing objective and truthful information in environmental reports.

In contrast to the lack of public transparency by Eapasa on disciplinary matters, the Legal Practice Council (LPC) currently has a list of nearly 50 attorneys who were either suspended or struck from the roll during 2026.

According to the council, a total of 314 legal practitioners were struck off and another 421 suspended from practice between 2019 and 2025.

When it comes to the regulation of environmental practitioners, however, Eapasa appears to be unwilling to disclose what actions it has taken to hold practitioners to account for breaches of its malpractice policy.

Penalties

In terms of its 2021 malpractice policy, EAPs can be fined R20,000 for each breach of the code of conduct (for a first or second offence).

They only become liable for temporary suspension from Eapasa (and further fines) if they are convicted of a

third offence.

They would only become liable for expulsion if found guilty for a fourth time and are then blacklisted for up to five years before becoming eligible to reapply for Eapasa registration.

The 2021 policy states: "All the charged EAPs and their contraventions and penalties will be advertised on the Eapasa website for a period not exceeding 5 years."

But this procedure appears to have changed in May 2026, with a revised malpractice policy now allowing for the expulsion of practitioners for a first offence (depending on the seriousness of the offence) as well as other lesser penalties, such as a warning, performing a public service, mentorship, work audits, monetary fines or even "yearly mandatory contributions to Eapasa conferences over a period of time".

The 2026 policy states that the severe sanction of expulsion for five years will be reserved for "repeated or severe violations of the malpractice policy".

Oddly, the wording of the new blacklist policy appears to have changed to give the Eapasa board more discretion on whether to publish details of convicted practitioners.

Whereas the 2021 sanctions policy explicitly requires publication of all contraventions and penalties for convicted EAPs on the Eapasa website, the new policy states that the details of disciplinary hearing outcomes and appeals "may" be published, at the discretion of the disciplinary committee "in accordance with a procedure as may be approved by the Board".

Naming and Shaming

In a separate annexure in red, titled "Publishing Sanctioned EAPs", the association says that the decision to publish the names of sanctioned practitioners is not "merely administrative".

It then sets out both the "pros" and "cons" of publishing such information.

Under "pros", it is argued that publishing details on the Eapasa website demonstrates that the association "has teeth" and shows the public and stakeholders that Eapasa is actively monitoring and enforcing standards.

"The tangible risk of public shaming and professional ruin is a strong deterrent against cutting corners, bias, or unethical behaviour. The potential damage to reputation outweighs the short-term gain from malpractice."

Another benefit of public exposure is that developers, clients and consultants can make informed decisions by not hiring practitioners with a history of malpractice.

"The market can self-correct, directing work towards practitioners with clean records. This creates a direct business incentive for ethical conduct and promotes reliability and credibility for both the EAP and the profession."

On the other hand, shaming practitioners also creates a variety of consequences and risks.

The annexure suggests that a public listing could become a "scarlet letter" that effectively ends a career, even for a single, relatively minor offence.

"It may preclude any chance of rehabilitation or meaningful return to the profession, which could be seen as unduly punitive," it is argued.

Publication could also expose Eapasa to defamation claims from sanctioned practitioners. To avoid such risks, Eapasa's professional conduct committee might opt for an overly risk-averse approach by issuing private reprimands instead of stricter sanctions.

The Eapasa document also suggests that publication of "a simple list of names and offences may lack crucial context. Was it a minor procedural breach or a major ethical violation? Was it an individual's act or a systemic failure of their company? The public may misinterpret the severity."

It suggests that this could lead to "unfair blanket condemnation where nuanced understanding is needed".

Finally, it suggests that publishing such a list creates "an operational burden" on Eapasa because "maintaining and updating a legally defensible public list requires robust administrative and legal resources."

"Every case must be documented for public consumption ... [so a] significant portion of registration fees may be spent on legal and administrative oversight of the disciplinary process rather than on professional development or standards improvement."

Eapasa concludes that publishing such a list is a "high-reward, high-risk transparency measure. The strongest argument for it is that it transforms the licensing system from a symbolic club into an accountable regulator, using market forces and public scrutiny as powerful enforcement tools."

"The strongest argument against is the potential for disproportionate, career-ending damage from errors or lack of context, which could create a defensive, non-transparent culture."

"Best practice tends to favour publication, but within a framework that emphasises procedural fairness, clarity of violations, and proportionality, often differentiating between private reprimands and public sanctions for serious malpractice."

In a press statement on 17 June, Eapasa announced the names of its new 11-member board, with both Sithole and Nkosi reaffirming their commitment to "professional excellence and ethical practice".

Yet both seem to have opted for silence, ignoring long-standing and legitimate questions about the association's apparent failure to publish any information about the outcome of its disciplinary hearings.

This article is an Opinion and was previously published in the Daily Maverick/ Maverick Earth/Shrouded in Secrecy



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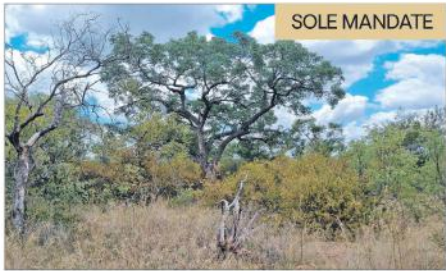
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Jason Jones - 083 267 4794 Ref: 2495456



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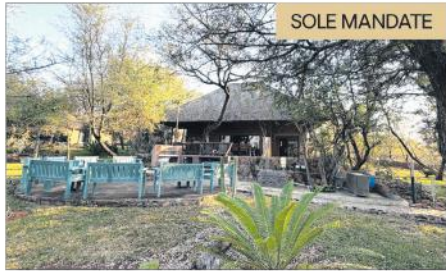
Enjoy comfortable living spaces, a spacious balcony with built-in braai and peaceful greenbelt views. With four air-conditioners, double covered carport, communal pool and secure estate living, it offers an attractive home or investment opportunity close to Hoedspruit's amenities.
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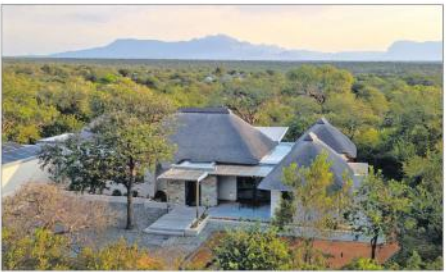
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Beds 3 | Baths 3 | Floor: 392 m²

Ultra-modern bush home with open-plan living, high ceilings and quality finishes. Interiors flow to a covered patio with built-in braai, pool and mountain views. Includes inverter, batteries, air-conditioning, security cameras, double garage, staff quarters and ample storage. Move-in ready.
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Calin Leppan - 082 824 9482 Ref: 2487357



ELEPHANT ROCK ECO ESTATE R 8 250 000
Beds 3 | Baths 3 | Floor: 360 m²

Brand-new home under construction on a private 2,956m² river-view stand, with completion expected by end August. Offers 360m² of living space, open-plan living and dining, modern kitchen, covered veranda and private patios. Includes double carport and approved plans.
Carika Fox - 071 911 9940 Ref: 2472196



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Calin Leppan - 082 824 9482 Ref: 2500711



SOLE MANDATE

LISSATABA NATURE RESERVE R 3 080 000
Beds 2 | Baths 2 | Floor: 162 m²

Brand-new, low-maintenance bush home with central living area and open plan kitchen. Set on a 7,500m² full title stand within a 2,500ha reserve. Includes two en-suite chalets with aircons, patios, and outdoor showers. Features include double carport, large boma, paved walkways, and tool shed.
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RENTAL

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Available immediately - Modern home with spacious open-plan living flowing onto a covered patio overlooking the pool and bushveld. Stylish kitchen, boma and outdoor living areas. Features include 4 en-suite bedrooms with outdoor showers, guest toilet, ceiling fans, double garage.
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Global Tracking Community Meets Near Hoedspruit

CyberTracker's international evaluator community is gathering this week (24–31 August) for the first time in the organisation's 30-plus year history - hosted outside Hoedspruit. This was all made possible thanks to the organisers, Kersey Lawrence and Lee Gutteridge.

Evaluators, indigenous knowledge holders, professional guides, citizen scientists, researchers and educators have travelled in from Africa, North America and Europe for the meeting. Between them they represent the current shape of CyberTracker Tracker Certification, and the conversations at this gathering are expected to help guide where the system goes next.

Organisers describe the group as overwhelmingly committed and frequently under-resourced - people for whom tracking is less a career than a calling. The meeting's stated aim is not to resolve every question facing the certification system, but to strengthen the community, share regional perspectives, and begin working through the harder questions together.

The programme is built around three equally weighted strands. "Inside" covers structured discussion on the CyberTracker Protocol, how it operates differently across regions, and unresolved questions about who the certification system serves and how. "Outside" is field time - tracking together, watching animal behaviour

on foot and from vehicle, and experiencing firsthand the skill the whole system exists to honour. "Voices" is dedicated space for indigenous and underrepresented participants to help shape the conversation's direction, rather than simply take part in it.

Days combine early-morning tracking activities with group discussion back at camp - on topics ranging from South Africa's new Guidelines for Spoor Ratings to the future of the Protocol - alongside further wildlife viewing and social time around the campfire in the evenings.

Organisers describe their approach as "intentions, not plans": a loosely structured programme built to bend around whatever the landscape of-

fers. It's a fitting rhythm for a gathering built around reading a landscape that rarely follows a schedule of its own.



CyberTracker

Celebrating Women in Women's Month

Marteen Michau

In the transfer and preservation of wealth for future generations, we recognise and embrace the crucial role of women in securing family legacies. In the spirit of Women's Month, we pay homage to generations of women who, against overwhelming odds and in the face of prejudice, have fought to look after their families – but also to make a difference in the workplace and in society, and to benefit our country and also our planet.

On 1 December 1955 in Montgomery, Alabama, a quietly strong woman named Rosa Parks refused to give up her seat on a public bus to a white woman, as the law in the US required at the time. Her arrest after her lonely act of courage led to a powerful address by Martin Luther King Jr to large crowds in the US, and a bus boycott that lasted 381 days and changed American history.

Striking a rock

Almost a year later, on 9 August 1956, more than 20 000 women marched to the Union Buildings in Pretoria, South Africa, in protest against proposed amendments to the 'pass laws'. Their song of protest – 'Now you've touched the women, you've struck a rock' – has come to represent women's courage and strength in South Africa. That day became the public holiday we now know as Women's Day, and the month of August is now dedicated to the women of our country.

A more recent example of female strength in the face of adversity is that of our former Public Protector, the indomitable Thuli Madonsela, who stood strong and unwavering against public denouncements, attempts to discredit her and even death threats in her fight against



corruption at the highest levels in our country.

Home and hearth

Closer to home and hearth, we pay tribute to the single mothers in our society – the women who are raising and instilling their values into the next generation of South Africans. Or who are supporting the education of young students. Or – if they are not entrepreneurs themselves – are the supportive partners of entrepreneurs and business leaders. In short – all the women who

are the backbone of their families. So are the grandmothers looking after grandchildren in communal homes so that their daughters can work and earn an income to create a future for the next generation. And then the daughters who often leave home in the dark of the morning, taking public transport to a job kilometers away, to return in the evening after dark and just in time to give their child a good night hug and tuck them into bed.

We think of women like Kuki Gallmann, a lone female voice in Kenya, who decided to make a dif-

ference by founding the Gallmann Memorial Foundation with the aim of preserving that country's natural resources, and ensuring the sustainable and creative use of the environment. Gallmann has endured more than her share of suffering in her lifetime, but still stands tall in her quest for the protection of our planet for generations to come, even though her home in the Kenyan bush is often under attack.

Coincidentally, we also celebrated World Elephant Day on 12 August, a day created in 2012 to increase awareness and protection of these magnificent animals. The matriarchs lead the herds, and in the process teach the elephant calves how to survive and behave in the wild. The young elephants look to the matriarchs for advice and their knowledge is passed down from generation to generation.

Family values and traditions

In our own species, it is also often the matriarch who keeps the family together. She's the one who ensures that the family values and traditions are entrenched and then passed on to the next generation, and that the family objectives are met from a social and philanthropic point of view. She's often the emotional leader of the family, in the best position to help resolve disputes which may arise. She also has the power to help strengthen the bonds between family members.

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Lakes That ‘Breathe’ Ancient Carbon: A Surprising Find in the Congo Basin

THIS IS AFRICA

M Barthel (Research Technician, ETH Zurich), A de Clippele (Scientist, ETH Zurich), J Six (Professor of Sustainable Agrosystems, ETH Zurich), T Drake (Postdoctoral Researcher, ETH Zurich)

In the heart of the Congo Basin's Cuvette Centrale, a large depression hosting the world's biggest tropical wetland complex, lie two vast, shallow blackwater lakes, Lake Tumba and Lake Mai Ndombe. Together they are roughly the size of 420,000 football fields.

These lakes include extensive swamp forests and peatlands that store enormous amounts of carbon and regulate water flows in the Democratic Republic of Congo. The floodplain lakes are shaped by rivers, wetlands and changing water levels over thousands of years.

The lakes' waters are so dark because of dissolved organic matter that has seeped in from the surrounding swamp forests, very much like black tea. Underlying the swamp forests is peat – highly organic soil which has accumulated over millennia from slow decomposition of waterlogged plant material.

These important peatlands cover only 3%-5% of the global land surface. But they are estimated to store about a third of the world's soil carbon.

We are scientists who investigate how ecosystems respond when forests, grasslands and other natural areas are converted to different uses. Together with our co-author Jose N. Wabakanghanzi of Congo's Atomic Energy Commission, we travelled to Mai Ndombe and Tumba to take samples of sediments from the bottom of the lakes. We also took samples of the greenhouse gases and dissolved carbon from the lake water.

We stumbled upon a surprise: the lake water contained large quantities of ancient carbon dioxide. After various complex chemical analyses,



we found that this ancient carbon dioxide must be from the surrounding peat which is leaking carbon into the lake. (By analysing the chemical signature of the carbon, we could tell it came from peat that had been stored underground for thousands of years rather than from recently decayed plants.)

The ancient carbon dioxide leaks are not dangerous but are worth investigating because it is important to monitor the ecological health of this important area.

About two million people live in and around this region and depend on it for fishing, transport, household water, farming and harvesting forest products such as fruits, medicinal plants and timber. The lakes and connected rivers are important transport routes linking remote settlements. The region is also home to rich biodiversity, including hundreds of fish species, crocodiles, hippos, forest elephants and a wide variety of birds. Their ecological health matters not only to people living nearby but also to efforts to conserve biodiversity and address climate change.

What Our Study Found

Scientists have long believed that peatlands lock away carbon for thousands of years. This is because they are waterlogged, which slows down the way that plant matter decomposes.

But if those conditions change, microbes can start breaking down the stored carbon and release greenhouse gases such as methane and

carbon dioxide into the atmosphere.

Our results show that these blackwater lakes in the peatland act like chimneys, constantly releasing a small fraction of this ancient carbon back into the atmosphere. We have not found this documented in any other scientific studies.

Although these results were surprising, we emphasise that this discovery is likely not a climate emergency. While environmental changes have the potential to destabilise the surrounding peatlands, it is more likely that this release is part of a perfectly natural cycle, one where a very tiny amount of carbon is lost but balanced by more peat forming and locking in more carbon.

We don't know if this is unique to the Congo Basin or occurs in other major peatland regions. And we don't know exactly what it implies for the carbon dynamics in the Cuvette Centrale.

The discovery of this natural pathway for the release of ancient carbon from the peatland only shows how much scientists still need to discover to achieve a sustainable balance between human development and long-term conservation of these natural ecosystems.

The Greenhouse Gases Being Released by Congolese Lakes Pose no Risk

The greenhouse gases released by these Congolese lakes are not toxic in these quantities.

Very rarely, other kinds of tropical lakes do release large plumes of car-

bon dioxide or methane. These are mainly very deep lakes connected to volcanic sources of greenhouse gases that can experience an abrupt lake overturn. This is a sporadic natural event that releases dissolved gases from the lake waters, potentially causing suffocation of people and livestock. It happened in Cameroon in 1984, at Lake Monoun, killing 37 people, and in 1986 at Lake Nyos, where 1,800 people died of suffocation.

Lake Tumba and Mai-Ndombe in the DRC are a different kind of lake, much too shallow for extreme gas concentrations to build in their depths and result in this abrupt outgassing.

When we released our research recently, there was a worrying amount of misinterpretation of our results.

Yahoo News wrongly described our research as a warning that an "ancient" threat could soon be released". Even a local Congolese publication falsely reported that a toxic gas leak had happened one hour from Kinshasa.

Whether this clear misinformation was spread due to "sensation" seeking journalism or because of a fundamental misunderstanding of the science presented cannot be said. What is important here is that careful science communication, which serves to bridge the gap between scientists and the public, is essential for science-based practices and policies.

To avoid misunderstanding, science and media should collaborate to clearly communicate the key nuances and limitations of complex findings. Readers can also help by critically evaluating media coverage through tracing back the sources, looking at the original press release and, ideally, reading the scientific paper itself.

The research consortium involved in this study is made up of ETH Zurich, UCLouvain, Woodwell Climate Research Center, Régie des Voies Fluviales, and Commissariat Général à l'Energie Atomique.

This article was previously published in The Conversation

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Beyond Women's Day:



Women already confident in using the fuel-efficient cookstoves demonstrate how to light and use them during a community cook-out

Lauren Booth
Kruger to Canyons Biosphere Communications Manager

On 9 August 1956, more than 20 000 women marched to the Union Buildings in Pretoria to protest the apartheid pass laws, demanding dignity, equality and freedom. Women's Month gives South Africans an important moment to remember those women, the courage of their stand and the rights for which they fought.

But recognition alone cannot fulfil those ideals. Dignity, equality and freedom are shaped by what happens in everyday life: who has access to opportunities, who controls resources, who participates in decisions, whose voice is heard, and who has the power to influence what happens as a result.

This is an important distinction, because participation and equality are not the same.

A woman can be present in a meeting, programme, training course or household and still have limited influence over decisions or resources. Gender inequality also does not operate in isolation. In the South African context, unequal access to education, income, ownership, services and decision-making structures can intersect with gender, increasing the distance between being included and having a meaningful say in the decisions that affect one's life.

For the Kruger to Canyons Biosphere

Region (K2C), this understanding has increasingly shaped the way gender is approached across its work. The shift can perhaps be explained most simply through a change in the question being asked. Rather than asking only, "How many women are participating in our programmes?", K2C is increasingly asking: "How are our programmes changing women's access to opportunities and their ability to act on them, their say in decisions, and what changes in their lives as a result?"

That difference lies at the heart of gender mainstreaming.

Looking Beyond the Numbers

Gender mainstreaming means building gender considerations into the way an organisation plans, implements, monitors and evaluates its work, rather than treating gender as a separate "women's component". A gender-responsive approach is what this looks like in practice: recognising that women, men, girls and boys may experience the same programme, service or environmental challenge differently, and deliberately designing work to respond to those differences.

At K2C, the Gender Working Group and Gender Action Plan help guide this approach, while the organisation's Gender Policy provides a formal framework for ensuring that gender equality is considered across both its programmes and its own or-

ganisational practices. The Gender Working Group serves as an internal platform to guide, strengthen and monitor this commitment, helping to integrate gender considerations across policies, projects, partnerships and organisational culture.

The Gender Policy requires gender analysis throughout the project cycle and calls for women to have greater opportunities to participate in decision-making and access resources and services. It also recognises that gender equality cannot rest on women alone, calling for men and boys to be engaged as agents of change. These principles extend to K2C's own organisational systems and practices, reinforcing that gender mainstreaming is both an external programme responsibility and an internal one.

What Changes When We Look Through a Gender Lens?

Across K2C's work, this lens is applied in different ways, from strengthening women's access to savings and financial literacy through Eco-Savings and Credit Groups, to designing the Absorbent Hygiene Products Project around girls' and women's lived experiences.

In rangeland management, it means recognising the different roles and voices involved in livestock and natural-resource management. Livestock programmes can easily focus on the person recognised as

owning the animals. However, ownership does not necessarily tell the full story of how livestock are managed within a household. Women, men and young people may have different roles in caring for animals, making household decisions and using natural resources.

Looking at a household through a gender lens therefore raises different questions. Who feeds or tends the livestock? Who makes decisions about their care? Who decides when an animal is sold? Who benefits financially from that sale? Who participates in decisions about grazing and other natural resources? These questions help identify people who are deeply involved in the livelihood but may not be the recognised livestock owner, ensuring that their roles and perspectives are considered when programmes are designed and implemented.

They also expose a more difficult issue. K2C's gender work has identified cultural barriers around livestock ownership for women, including barriers that can limit women's opportunities to move from livestock care into greater ownership and decision-making. There are no simple programme solutions to deeply rooted social and cultural norms. K2C's Gender Policy recognises that relationships of inequality can become so embedded in everyday ways of thinking and behaving that they begin to appear "natural".

Cont. on next page

Equality is More Than Being Counted



Meaningful engagement with community members (top left).
Women are involved in practical live-stock management activities across the K2C landscape (above right).
Women's roles in livestock management extend from everyday animal care to technical animal-health activities and skills development (left).
All images supplied by K2C Biosphere

Cont, from previous page

Changing those patterns therefore requires more than inviting women into a programme or creating an opportunity on paper. It requires understanding the conditions that shape whether women can access that opportunity, whether being part of the programme gives them meaningful influence, and whether the people and structures around them support change.

This is also why engaging men, boys, households and communities is critical. If established patterns of ownership and decision-making involve entire families and communities, meaningful change cannot rest on women alone.

The same principle can play out very differently in another programme. In Xikukwane Village, monitoring by the Community Solutions Team showed lower-than-expected use of K2C-distributed fuel-efficient cookstoves, but the numbers alone could not explain why. By listening to community members, mainly women and girls responsible for preparing meals at home, the team learned that some preferred cooking pots did not fit the stoves, while others were unsure how to light and use them correctly. The response was a practical community cookout and a practical community cookout and refresher session, demonstrating the stoves with familiar meals

and drawing on the experience of women already using them.

The example is simple but important: understanding who is actually using an intervention, and listening to their experience, can change how a programme responds.

Participation is the Starting Point, Not the Finish Line

Counting participation remains useful, but numbers cannot tell the full story. A programme may have strong female participation while women still have limited influence over decisions or provide access to training without changing access to resources or opportunities. Gender mainstreaming therefore keeps looking beyond the first number: Who spoke? Who decided? Who benefited? Were women able to influence decisions and lead? Did anything meaningful change as a result?

Gender mainstreaming is an ongoing process, not evidence that gender equality has already been achieved. And there is still a long way to go.

Progress means moving towards a landscape where women are not simply represented, but are increasingly able to access opportunities and resources, have a meaningful say in decisions that affect their lives, and influence what happens as a result.

What Happens After 9 August?

Women's Day and Women's Month remain important. They remind us of what was fought for, the progress South Africa has made, and how much remains unresolved. But the ideals represented by the women who marched in 1956 cannot belong to one commemorative date.

Those ideals are shaped by what happens every day of the year, in households, workplaces, community structures, organisations and programmes. We need to look critically at the systems, opportunities and conditions that enable women to participate, lead and thrive, as well as those that continue to limit them, and have honest conversations about both.

Women's Month gives us an occasion to reflect, but gender equality cannot belong to one date on the calendar. It has to influence the questions we ask and the choices we make every day, across projects, partnerships and communities.





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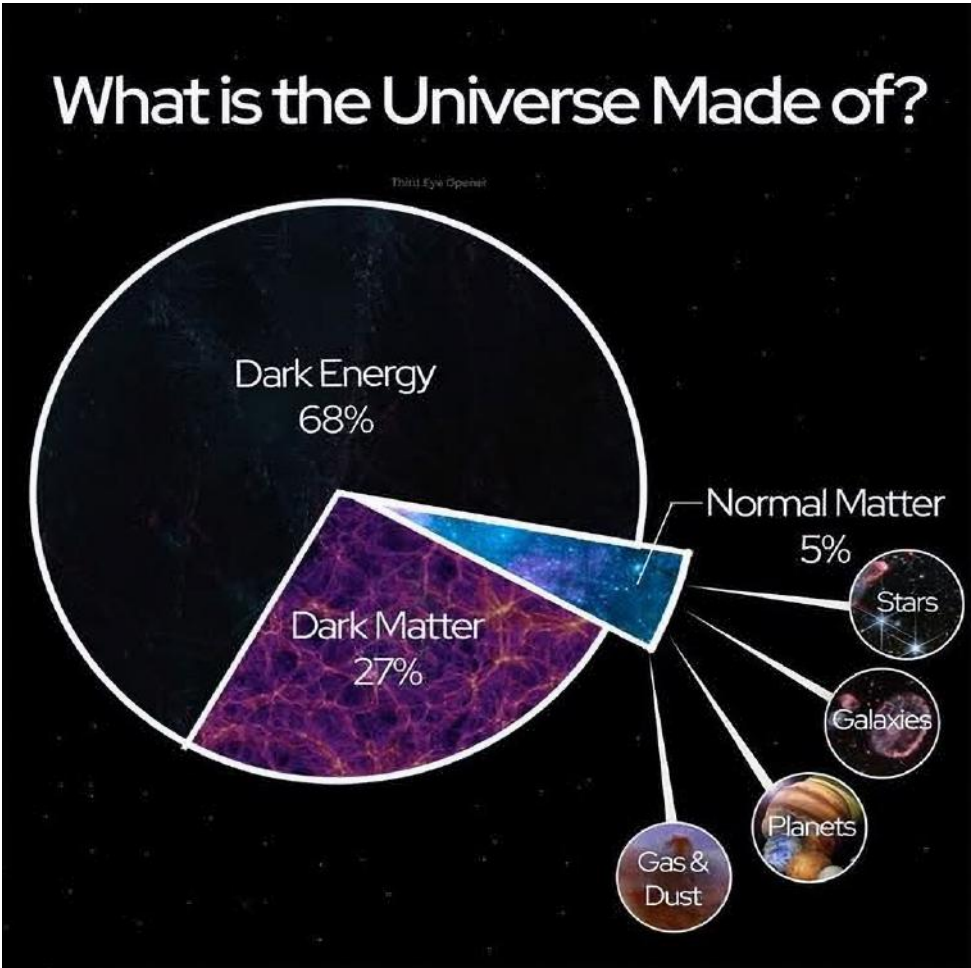


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The Roman Empire Strikes Back

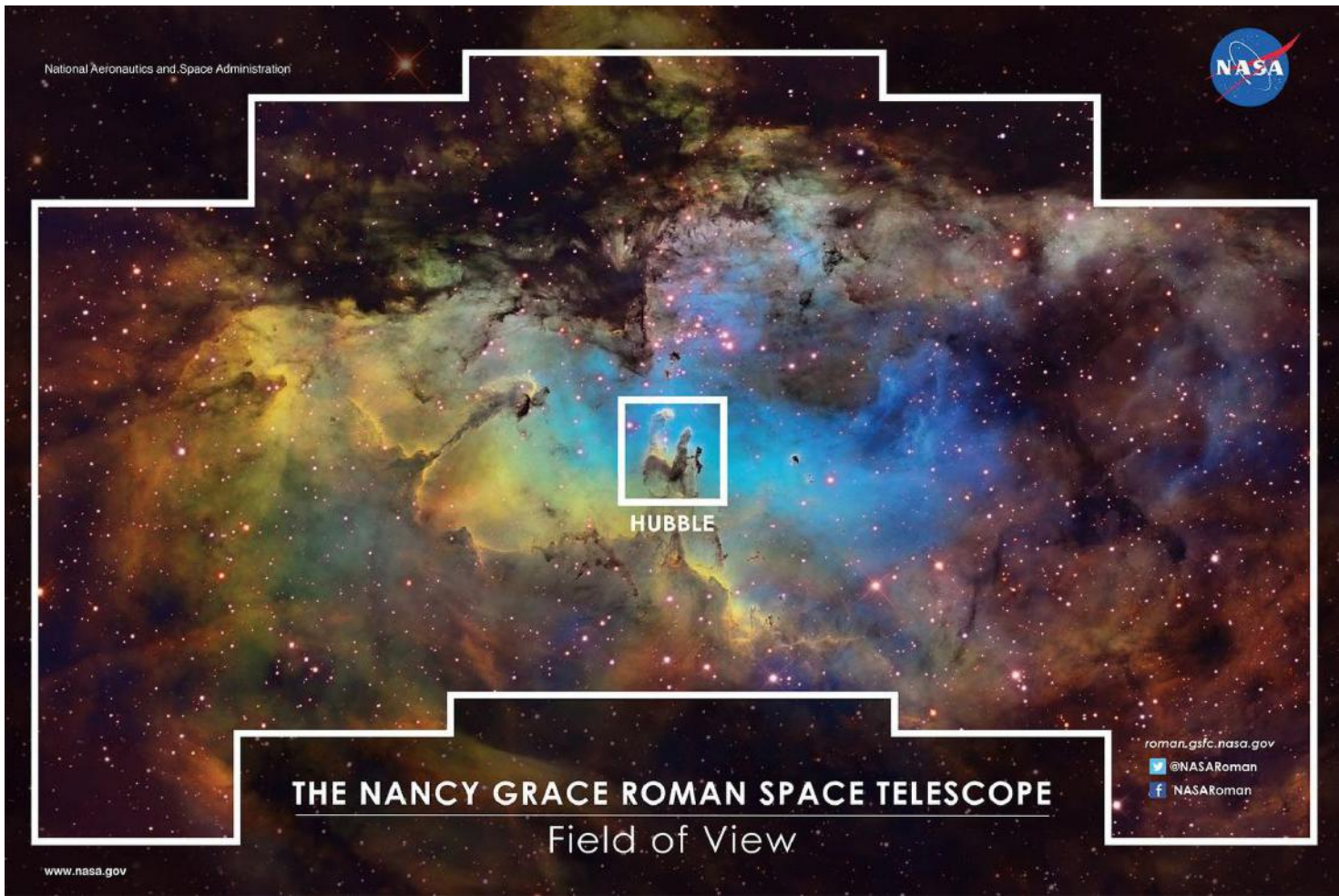


Make Up of the Universe (top left)
Credit Third Eye Matter

Nancy Grace Roman (top right)

Nancy Grace Roman Telescope (above)
Credit - GFSC SVS.

Roman Telescope vs Hubble FOV (left)



Ben Coley
Celestial Events SA

If all goes according to plan, by the time this article is published, the next great cosmic observatory should be on its way to its new home. The Nancy Grace Roman telescope is NASA's latest offering to aid in our understanding of the Universe. It will join Hubble and James Webb in scouring the cosmos, trying to unlock its deepest and darkest secrets.

The telescope is named after Nancy Grace Roman, a brilliant scientist who served as NASA's first chief astronomer in the 60s and 70s. She is most noted as being the driving force behind the development of the Hubble Space Telescope, as well as campaigning for its approval and funding. Because of her vital involvement, she is often referred to as the *Mother of Hubble*. It is fitting then, that the next great space telescope is named in honour of the woman who pioneered the era of modern

space observatories. The Roman telescope is not designed to replace any of the current observatories, but will rather complement them, widening our view of the expanse of space, literally. Whilst Hubble and JWST offer incredibly detailed, close-up views of objects, Roman's technology will allow it to survey vast swathes of the Universe at once thanks to its 300-megapixel wide-field camera. This amazing piece of optical engineering will produce a field of view more than 100x larger than Hubble, but maintain a similar image sharpness, allowing astronomers to examine much larger expanses of space, in a *much* shorter period of time. Roman is designed to see in the visible and near-infrared wavelength of light. Its power is its ability to survey large areas, and when a particularly interesting object is identified, JWST, with its 6.5m mirror, and deep infrared capabilities, can be called upon to reveal specific detail. Roman has 3 main mission goals:

Understanding Dark Energy
Most people know that the Universe is expanding, but what is unusual is that the more it expands, the faster its rate of expansion. This was an unexpected discovery since gravity should slowly begin to slow the expansion, the same way that a ball thrown into the air, will eventually slow and ultimately fall back down. This suggests that there is some unknown force acting on the Universe, 'pulling' it apart, counteracting gravity. Roman will peer at distant galaxies and try to help us understand more about this invisible force. Why is the Universe expanding? Is dark energy constant, or is it variable? Is our current understanding of the laws of gravity wrong?

Mapping Dark Matter
Dark matter is the invisible 'stuff' that seems to envelop galaxies, stopping them from tearing themselves apart. Frustratingly, this strange substance does not emit, absorb or reflect light



in a way we can readily detect, but its effects can be mapped by watching how objects interact with it, and how its gravity distorts the light from distant objects behind it. Roman will look at millions of galaxies and try to gain a better understanding of the mechanics of this mysterious, seemingly invisible phenomenon.

Searching for Exoplanets
For decades we have known that our solar system is not unique. Astronomers suspect that almost every star has planets orbiting it, offering an almost infinite number of strange new worlds to be understood. Roman will direct its mirror at the heart of our galaxy, where billions of stars orbit our central supermassive black hole. It will use a technique called 'gravitational microlensing', in which the gravity of a foreground star acts as a natural magnifying glass. An orbiting planet can produce a tiny additional change in the magnified light, revealing its presence. Perhaps the most exciting thing about Roman, is what else it will discover. As technology continues to rocket forward, so does our ability to discover things that we did not know existed, or even contemplated. Roman promises to discover as many new secrets that it unlocks - but that is the fun part! We are only just beginning to understand the Universe and now have a new tool with which to examine it. Space remains the ultimate mystery, a place where anything we can imagine may well exist ... We just have to find it.

Ben Coley / Celestial Events SA can be contacted on 079 575 0900.

New Panels Reveal the Hidden Lives of Graskop Gorge’s Trees



Visitors to the Graskop Gorge Lift Co in Mpumalanga can now learn much more than the names of the trees lining its forest trail, with 50 new interpretation panels installed to reveal the plants’ hidden role in the Afromontane forest.

Around 50 tree species have long been identified with name plates, but the new panels provide a closer look at their leaves, flowers and fruit, as well as the birds, bats, butterflies and moths that depend on them.

The panels were created by Mbombela-based Hamilton-Fynch, which specialises in developing interpretation and visitor information media.

According to Hamilton-Fynch, simply naming a tree tells visitors what species they are looking at, but not much about the tree itself or its role in the ecosystem. This is particularly relevant at the gorge, where many of the trees have canopies high above the forest floor, making their leaves, flowers and fruit difficult to see.

The new panels bring those details down to eye level, giving visitors a better understanding of the forest and the relationships between its plants and animals.

More Than Just a Forest Trail

The panels form part of a broader effort to help visitors understand the ecological importance of the gorge, rather than simply experience it as a scenic tourism attraction.

The Graskop Gorge Lift Co is situated in an Afromontane forest ecosystem within a 60m-deep gorge. Afromontane forest covers less than 1% of South Africa’s landmass and

provides habitat for a range of specialised species.

The gorge is home to species including the critically endangered Graskop cliff aloe (*Aloe nubigena*), which has a highly restricted range, as well as the Natal ghost frog and Rainforest Brown butterfly.

The tourism operation has been designed to allow visitors to experience this environment while limiting their impact on it. Its 51m glass-fronted viewing lift and network of elevated timber boardwalks keep visitors above the forest floor, helping to prevent soil compaction and damage to the undergrowth.

The 600m Forest Trail was extended to a 1 000m walkway in 2025 with the addition of the Next-Level Walk, which follows the cliff face to the Cliff Café. This unique café sits against the cliff and overlooks the forest below.

Explaining What Visitors Cannot See

Lesley Lane of Hamilton-Fynch says the interpretation is intended to make the forest’s hidden biodiversity easier for visitors to understand. “The forest experience at Graskop Gorge Lift Co invites visitors to step into an enchanting world where towering trees whisper stories of ancient ecosystems,” she says. “It offers a breathtaking journey through the lush, untamed forest; a sensory escape unlike anything else in the region.” The tree panels are part of a growing collection of interpretation material at the attraction.

Earlier this year, Hamilton-Fynch completed several large biodiversity panels, measuring about 2 000mm

by 800mm, with information about the life supported by the forest.

More Panels Planned

The next project will focus on the changes taking place in the forest following recent storms.

Karl Lane of Hamilton-Fynch says panels explaining gap dynamics – how plants grow and change in an area of forest after a gap is created by a natural disturbance – are being developed. “We are working on an explanation of gap dynamics, why it happens, what its benefits are and how it recovers,” he says.

Panels about the gorge’s bats are also planned. As many as 14 bat species are likely to occur at different levels of the forest, depending on the species.

The projects form part of Graskop Gorge Lift Co’s effort to combine tourism with conservation, using the attraction itself as a way of educating visitors about the fragile ecosystem surrounding them.

A 60-page booklet, ‘Into the Mist: Discovering the Hidden Wonders of the Panorama Route & Graskop Gorge’, is also available for purchase. The booklet explores the wider Panorama Route and includes a map of the area, identification of the main mountain peaks, information on local geology and cultures and a map highlighting the region’s different biomes, including grassland and savanna. It also features information specific to Graskop Gorge, including its trees, reptiles, mammals and insects.



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Beyond the Boundary:



Vulture sitting on a hippo carcass

BirdLife South Africa's Vulture Project

There are few sights in the African sky to rival a vulture on the wing. Barely a feather moves as it carves a slow arc on a rising thermal, holding altitude on a two-and-a-half-metre wingspan while scanning the ground far below. Vultures can soar vast distances each day, ignoring property and country borders, navigating an ever-changing landscape in search of food.

For all that grandeur, vultures are one of the most threatened bird groups. In South Africa, five species are listed as Critically Endangered, one step away from extinct in the wild. Populations of some species have fallen by as much as 90% over the past 50 years. Vultures are the landscape's clean-up crew, stripping a carcass in a matter of hours and removing carrion before it becomes a problem.

In doing so they suppress the spread of diseases such as anthrax, botulism and rabies, and limit the build-up of other scavenger populations that carry disease into livestock herds and human settlements. A recent study on the economic value of vultures from ecosystem services provided in Botswana, Zambia and Zimbabwe was estimated to be over USD 250 million per year.

Vultures face a multitude of threats. Mass poisoning events, in which a single laced carcass can kill hundreds of birds at once, have devastated populations within the greater Kruger region. Targeted harvesting for the traditional medicine trade, or to hide the actions of poaching, have killed over 2000 vultures in the wider Limpopo Transfrontier Conservation Area since 2015. Collisions and electrocutions with energy infrastructure and loss of habitat compound the problem for these slow-breeding birds that typically lay a single egg

each year.

There is one more threat, less visible than the rest and only recently understood, caused by lead-core ammunition.

An invisible problem

In 2016, BirdLife South Africa began investigating lead levels in vultures and other raptors. Blood sampling soon showed that lead exposure was not an isolated occurrence, with both White-backed and Cape Vultures showing elevated levels. Subsequent research, including a PhD by Dr Linda van den Heever, traced the source of this exposure to spent lead-based ammunition. Upon impact with its target, a lead-core bullet fragments extensively, leaving numerous particles, often microscopic, within the carcass and surrounding tissue. Vultures are exposed to toxic lead fragments when they feed on discarded gut piles and carcass waste. Their highly acidic di-

gestive systems facilitate the absorption of lead into the bloodstream, where it can be distributed throughout the body.

The impacts of lead poisoning are complex and severe. Acute poisoning can be fatal, while sub-lethal exposure can impair haemoglobin production, causing anaemia, and affect neurological function. Vultures suffering from lead poisoning are often weak, uncoordinated and emaciated, making these normally feisty birds much easier to catch and bring to a wildlife veterinarian for treatment. The risk is particularly concerning for chicks, which can be unknowingly fed contaminated carrion by their parents. At this critical stage of development, exposure to lead results in chicks fledge with compromised health as they develop flight muscles and learn to navigate their aerial landscape.

Blood sampling of White-backed Vultures in the Northern Cape since 2016 reveals that elevated lead levels remain a persistent threat within the population, with similar trends observed in KwaZulu-Natal. A study by Swart *et al* (2026) found that over one-third of the samples had above background exposure.

Vultures are not the only wildlife at risk. Southern Ground Hornbills have been documented suffering acute lead poisoning, with spent ammunition found in the gizzard, requiring intensive treatment. There is evidence of exposure in large carnivores too. In a case reported by Hauw *et al*. (2025), a cheetah held in a boma in Namibia developed acute lead poisoning after being fed game meat harvested using lead-core ammunition. The cheetah subsequently suffered a seizure and died, and spent ammunition was recovered from its stomach.

These cases highlight that the pathway from ammunition to wildlife extends well beyond vultures. Wherever animals consume carcasses, gut piles or game meat containing fragments of lead ammunition, there is potential for exposure. In a landscape where wildlife relocations are routine, lead exposure in bomas can be a source of unintentional poisoning.

A landscape-scale response

The encouraging news is that a solution already exists, and it is increasingly a local one. Lead-free ammunition, typically copper-alloy or brass monolithic bullets are made of non-toxic metals that do not fragment in the same way as lead-core bullets. South Africa has a growing domestic manufacturing sector with over a dozen manufacturers producing factory rounds in most of the common calibres, and bullets for hand-loaders in all diameters, and uptake is rising steadily.

BirdLife South Africa's Vulture Project is working to accelerate that shift across the hunting, culling, ecotourism, and game management sectors. Our work includes ballistic testing, with a particular focus on locally produced lead-free ammunition, and gathering data on real-world field performance in partnership with the hunting and game management sectors. The aim is to collect evidence and produce best-practice guidelines that lead-free ammunition performs, is available, and that switching costs the shooter very little while returning a great deal to the landscape.

Cont. on next page

Tackling Lead Poisoning Across Vulture Landscapes

Cont. from previous page

In a region defined by its shared boundaries, that is a change we can make together. Providing safe food is crucial to assisting the highly threatened vulture populations within the Kruger to Canyons Biosphere Reserve and beyond. Landscape conservation efforts involving all stakeholders are required to reduce the impacts from lead poisoning.

An Industry that Can Make a Difference

A particular group of professionals with a unique opportunity to make an impact is safari guides. Inherently seen as custodians of nature, they occupy a unique position to reduce the use, and by implication the impact, of lead-based ammunition on vultures and the wider environment.

As professionals who spend considerable time in the field, guides are often able to influence the practices and purchasing decisions of the operations they work for, as well as engage with influential, high-net-worth tourists.

Where a firearm is required for walking trails, bush walks, or other legitimate safety purposes, guides can advocate for the use of lead-free ammunition as a standard operational requirement. This is a relatively simple change that can be made on the part of an employer, but one that can meaningfully reduce the risk of lead entering the environment and subsequently affecting wildlife and the surrounding ecosystem.

Just as importantly, guides can – and should – do their best to lead by example. Carrying lead-free ammunition whenever a rifle is re-

quired demonstrates that responsible guiding extends beyond the guest experience and includes a much deeper, broader understanding and respect for our impact on the environment and the associated ecological consequences of our actions. As storytellers, it can turn a simple coffee stop with guests into a deeper interpretation of the composition of the rounds on a guide's hip, and how it's not just the impact of a bullet that can be considered deadly.

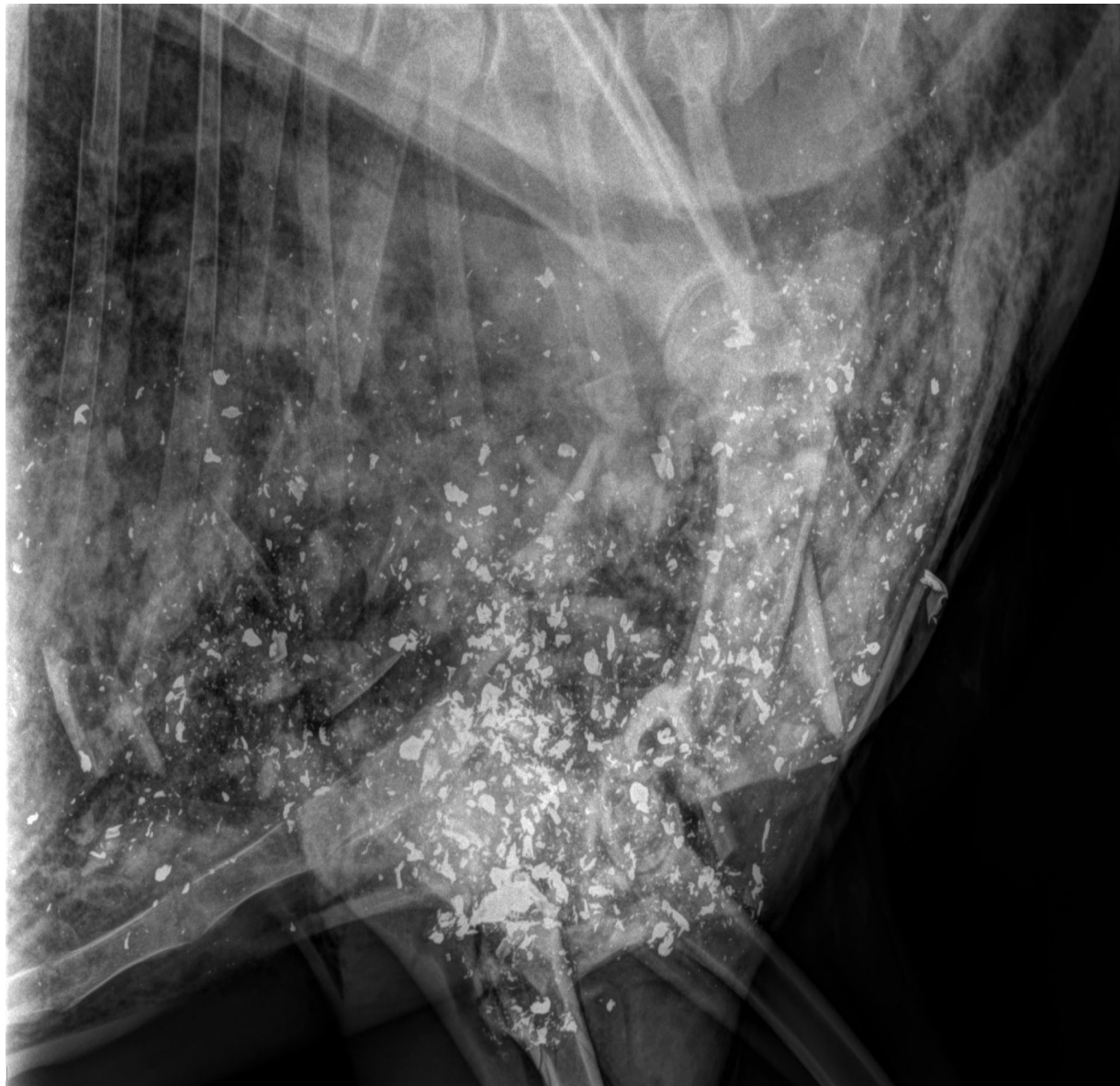
By encouraging employers to adopt lead-free ammunition policies, explaining how they can justify the change to link to a broader impact narrative, and by making responsible choices themselves, safari guides can help ensure that the places in which they work remain safe not only for people but also for

wildlife.

Conclusion

Shifting to lead-free ammunition in hunting, guiding and game management reduces lead exposure for threatened wildlife and people. It is a small change with big consequences, helping safeguard species beyond any boundary.

Justin Henry – Vulture Project Manager, BirdLife South Africa
John Kinghorn – Avitourism Project Manager, BirdLife South Africa



An X-ray showing tiny lead fragments in the chest of a deer shot with lead bullets (above left). Image Jordan Hampton, University of Melbourne. Lead-core bullet fragments (top) and lead-free bullets (above).

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Seaweeds Are Not Plants – And Six Other Surprising Facts About Aquatic Flora

Alexander Bowles
Glasstone Research Fellow, Plant Science, University of Oxford

Hidden beneath the water's surface is a botanical world that is among nature's most innovative and ecologically important.

As I highlighted in a recent paper, an extraordinary range of adaptations have evolved in aquatic plants for life beneath the water's surface. Some flower underwater; others capture animals in ingenious traps. Here are seven facts that show how these remarkable organisms challenge our assumptions about what plants are and how they survive.

Many people think of plants as nice-looking greens. Essential for clean air, yes, but simple organisms. A step change in research is shaking up the way scientists think about plants: they are far more complex and more like us than you might imagine. This blossoming field of science is too delightful to do it justice in one or two stories. This article is part of a series, Plant Curious, exploring scientific studies that challenge the way you view plantlife.

1. Plants Can't Stop Returning to Water

When we think of plants, we often picture life on land: forests, grasslands and meadows. Yet throughout their evolutionary history, plants have repeatedly returned to the water, where they first evolved. Around 500 million years ago, plants moved from water onto land. Since then, many have moved back. Scientists estimate that the aquatic lifestyle has evolved independently more than 100 times across different plant groups.

Water lilies float their leaves on the surface, duckweeds drift freely and seagrasses live entirely submerged in the ocean. Some of these groups made their return over 100 million years ago. The repeated evolution of aquatic plants is one of nature's most striking examples of convergent evolution.

2. The Plants That Aren't Plants

Some of the most conspicuous organisms beneath the waves are seaweeds. They photosynthesise and often resemble underwater plants. Yet despite their appearance, seaweeds are not true plants.

Seaweeds belong to several distinct lineages of algae found across the evolutionary tree of life. The giant kelps that form underwater forests are brown algae. Nori and dulse are red algae, while sea lettuce belongs to the green algae.

Unlike plants, they lack true roots, stems and leaves, and they do not produce flowers or seeds. However, their plant-like appearance is a reminder that evolution can produce similar forms in very different groups of organisms when they face similar environmental challenges.

3. Great Depths

Plants need sunlight to photosynthesise, which usually limits them to land or shallow water. Yet some aquatic mosses survive at astonishing depths. Knieff's hook-moss (*Drepanocladus aduncus*) has been



recorded at 140 metres below the surface in the exceptionally clear waters of Crater Lake, Oregon, US. This makes it the deepest known underwater plant which also grows on land, surviving at a depth greater than the height of the London Eye.

Deep-water mosses have also been recorded in lakes in New Zealand, Antarctica and elsewhere, so deep these environments are effectively pitch black and few animals can survive.

4. Rootless

Roots are one of the defining features of plants, anchoring them in the ground and absorbing water and nutrients from the soil. Yet many aquatic plants have reduced their roots dramatically - and some have seemingly lost them altogether.

Life underwater changes the rules. Water and dissolved nutrients surround the plant, making extensive root systems less important than they are on land. Instead, many aquatic species absorb nutrients directly through their leaves and stems.

Duckweeds provide one of the most extreme examples. Some species have only a single root compared to multi-rooted relatives like giant duckweed. Members of the genus *Wolffia* – the world's smallest flowering plants – have no roots at all, floating freely on the water's surface. Individual *Wolffia* can be a millimetre in length, with flowers at 0.3 millimetres.

5. Underwater Carnivores

Not all aquatic plants rely on sunlight and dissolved nutrients. Some supplement their diet by capturing and digesting animals.

The most spectacular examples are the bladderworts (*Utricularia*), a group of rootless aquatic plants found in freshwater habitats around the world. Their leaves are modified into tiny bladder-like traps that create a vacuum by pumping water out of the chamber.

When a small animal brushes against trigger hairs near the trap entrance, a door springs open and the prey is sucked inside in less than a millisecond. This makes bladderwort traps among the fastest movements in the plant kingdom. While they usually capture tiny aquatic invertebrates, fish larvae and tadpoles have occasionally been recorded as prey.

The carnivore lifestyle allows blad-

derworts to thrive in nutrient-poor waters where other plants struggle.

6. Pollination by Current

When we think of plant pollination, people often picture bees buzzing between colourful petals on a sunny afternoon. However, if your flower is underwater, pollination becomes tricky. Instead of relying on insects or wind, many aquatic plants such as the seagrasses have turned water itself into their personal matchmaker, allowing the water's currents to drift pollen directly to its destination.

To attract pollinators, land plants routinely release airborne perfumes. But beneath the water's surface, these traditional gas signals do not work effectively. This limitation has led to an evolutionary shift: underwater pioneers like seagrasses have lost the genes responsible for producing these airborne scents. These no longer provided an advantage so they were lost over time.

7. Seagrasses and Mangroves are Major Carbon Sinks

Seagrasses and mangroves capture and store carbon in their tissues and the sediments beneath them, making them some of the planet's most effective natural carbon sinks. Together with seagrass meadows, they store what scientists call "blue carbon" – carbon trapped in coastal ecosystems that can remain locked away for centuries or even millennia.

These ecosystems, including seagrass meadows and mangroves, store 11.5 billion tons of carbon worldwide. Of the 11.5 billion tons of carbon stored, mangroves represent the largest blue carbon pool at 6.5 billion tons.

Whether they are trapping prey in milliseconds, growing in near darkness or storing carbon for centuries, aquatic plants demonstrate the remarkable versatility of life.

This article was previously published in *The Conversation*

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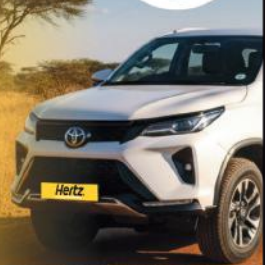
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South Africa Is Overlooking Solar Technology That Can Keep Generating Electricity After Sunset

Craig McGregor
Professor in Mechanical and Mechatronic Engineering, Stellenbosch University

South Africa's coal-fired power stations are retiring. The country must replace a huge amount of electricity over the next two decades. Currently, coal still supplies 74% of the country's power. But the government's national energy plan has largely overlooked one technology South Africa is particularly suited to build: concentrating solar power.

There are two main ways of generating electricity from the sun. Photovoltaic (rooftop) solar panels convert sunlight directly into electricity. Big concentrating solar power farms use mirrors to concentrate sunlight into heat. This heat is then used to produce steam that drives a turbine to generate electricity.

Concentrating solar power works only with direct normal irradiance. This is sunlight that travels straight from the sun, rather than light scattered by clouds, dust or moisture. This direct sunlight can be concentrated to produce extremely high temperatures.

Because of its dry climate, clear skies and low cloud cover, South Africa has some of the best direct normal irradiance in the world, second only to Chile's Atacama Desert.

South Africa once planned to build more concentrating solar power plants, but those plans were gradually scaled back. No new projects have been approved since 2014. Even so, the country already has several concentrating solar power plants, built by private companies through the government's renewable energy programme. These generate about 600 megawatts of electricity, or enough to power roughly 350,000 to 400,000 average three-bedroom homes each year.

As an engineer and the director of Stellenbosch University's Solar Thermal Energy Research Group, I've been part of teams who've done research modelling how these systems integrate with the South African grid and their construction costs. I believe that South Africa abandoned this clean electricity that is so easy to connect to the national grid because it valued the wrong thing (cheap daytime electricity instead of reliable electricity).

The government's energy plan compares the cost of electricity from ordinary solar panels during daylight



hours with the cost of building concentrating solar power plants. On paper, ordinary solar looks much cheaper, costing about US\$35 (R576) per megawatt-hour. But solar panels don't generate electricity at night and adding batteries to store enough electricity to cover a full night raises the cost to about US\$166 (R2,735) per megawatt-hour.

By comparison, concentrating solar power, which stores heat during the day and uses it to generate electricity after dark, costs about US\$95 (R1,565) per megawatt-hour.

The government's energy plan also favours nuclear power, which costs US\$140/MWh (R2,312) and is about to invest R2.2 trillion (US\$128 billion) in this. I argue that this is a huge mistake. Concentrating solar power is far cheaper.

Why South Africa Needs Concentrating Solar Power

One advantage sets concentrating solar power apart from ordinary solar panels: it can keep generating electricity after the sun goes down.

Photovoltaic or rooftop solar panels generate electricity only while the sun is shining. But electricity demand is often highest in the evening, when people arrive home, cook dinner, switch on lights and watch television. This ability to produce electricity whenever it is needed is known as dispatchability.

Concentrating solar power stores energy as heat rather than electricity. During the day, mirrors concentrate sunlight to heat molten salt to about 565°C. The hot salt is stored in insulated tanks and later used to produce steam to drive a turbine, even after sunset. Modern plants

can store enough heat to keep generating electricity for 12 to 20 hours. In summer, some can operate almost around the clock.

Storing heat is also much cheaper than storing electricity in batteries for long periods. Batteries work well for supplying electricity over a few hours. But thermal storage costs only a fraction as much for overnight storage. Once this ability to provide electricity on demand is included, concentrating solar power becomes far more competitive than a simple comparison of daytime electricity prices suggests.

Concentrating Solar Power and Green Jobs

This could also create far more manufacturing work in South Africa than photovoltaic or rooftop solar systems. Most of the cost of a photovoltaic system is in the solar cells. These are almost entirely imported and only assembled in South Africa.

On the other hand, concentrating solar plants are built overwhelmingly of concrete, steel and glass – the things South African industry already makes. Up to 60% of the components needed for a concentrating solar plant could be bought from local South African factories.

South Africa has also shown it can develop world-class concentrating solar power technology. The award-winning Stellio heliostat, regarded internationally as one of the most efficient and lowest-cost mirror systems, was conceived here and designed for local manufacture. China deploys it at scale. South Africa did the pioneering work, but another country built the industry.

What Needs to Happen Next

The government's next version of the national energy plan must calculate the cost of electricity at the point it is delivered to consumers, not at the point it is generated. The Department of Electricity and Energy, working with the Council for Scientific and Industrial Research, has the modelling capacity to do this. It just needs to move away from the government's public position that concentrating solar power is more expensive than rooftop solar.

Alongside the energy plan, South Africa also needs a strategy to build a local concentrating solar power industry. The Department of Trade, Industry and Competition and the Industrial Development Corporation could compel future concentrating solar power projects to buy more components from South African manufacturers, such as mirrors, storage tanks, receivers and heliostat frames. This is the same approach that helped grow the country's photovoltaic assembly industry.

The modelling we do at the Stellenbosch University's Solar Thermal Energy Research Group suggests that South Africa's electricity grid has room for 6 to 10 gigawatts of concentrating solar power. That is enough capacity to supply roughly 3.5 million to 6.5 million average three-bedroom homes over a year, depending on how the plants are operated.

Even more energy could be added to the grid once local manufacturing starts bringing the costs down. Smaller rooftop concentrating solar systems could also replace the diesel and electric boilers that many industries use to generate heat for manufacturing processes.

South Africa has the resources and the industry. What the country lacks is a plan to roll out concentrating solar power and a procurement programme to make sure that most of the components are produced locally. With a proper plan in place, concentrating solar power stops looking like a technology we can afford to ignore, and starts looking like one we cannot afford to keep ignoring.

This article is based on Craig McGregor's recent inaugural lecture as a full professor at Stellenbosch University.

This article was previously published in The Conversation

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Social Capital - The Currency That Cannot Be Printed

Andrew Paterson
Philosafaris.com

I have watched countless breeding herds of African elephant consisting of a senior cow, elder females and younger cows, all the way down to juveniles of both sexes - the young males are banished from their natal herd around their early teens - yet I'm ever fascinated by the quality of synchronised attention this matriarchal sisterhood constantly pay to one another.

On a recent trail I observed a small calf stumbling up a steep bank of the Luvuvhu River in the far north of the Kruger National Park. Instantly, three of the nearest adult cows turned simultaneously - not in alarm, but in the unhurried, certain manner of those who have arranged themselves, over years, to know where the vulnerable members are. On roads, the matriarch usually positions herself between her extended family and a vehicle long before any signal that I can detect has passed between the animals. A young bull, nearing his teens and starting to push his social boundaries within the herd, tests a situation that the matriarch has already assessed and decided against. He reads her posture, pauses, and follows her better judgement.

There is nothing sentimental about what I am watching. It is a system operating through accumulated, embodied trust - decades of shared experience compressed into the instant legibility of posture and proximity. The herd does not deliberate. It knows. And what it knows has been built, slowly, through the most ordinary medium in ecology: relationship.

This is social capital. And in Brian Walker's framework of Social-Ecological Resilience, it may be the attribute that, more than any other, determines whether a system survives the moments that cannot be planned for.

What Social Capital Is

Walker defines social capital as the trust, well-developed social networks, and effective leadership that allow communities - human or otherwise - to coordinate responses to disturbance. It is not the same as social contact, or even social cohesion. A crowd has neither trust nor effective leadership; it has proximity. Social capital is the functional infrastructure that makes collective action possible when conditions change rapidly and the cost of getting it wrong is high.

In social-ecological systems, this infrastructure operates at multiple levels. At the community level, it is the network of relationships through which information flows - who knows what is happening at the far end of the watershed, who can be trusted

to report accurately, who has the credibility to call for collective restraint when restraint is needed. At the leadership level, it is the quality of judgement that allows one individual or council to act as a trusted node in that network - not because they hold authority by appointment, but because they have earned it through demonstrated reliability over time.

Walker is characteristically precise about leadership here. Sometimes resilience requires a strong visionary individual who can hold a course under pressure and absorb the uncertainty that would otherwise paralyse a group. At other times it requires what he calls shepherding - leading from behind, facilitating rather than directing, drawing out the distributed knowledge of the community rather than imposing a central view. The skill lies in knowing which one the moment demands. Misjudgement that - apply a visionary's forcefulness to a situation calling for distributed wisdom or offer facilitation when the situation demands decisive commitment - and the social capital that enables response erodes precisely when it is most needed.

The Luvuvhu River and the Oxpecker's Contract

The floodplain forests along the Luvuvhu River support one of the highest densities of nyala in southern Africa, alongside leopard, bushbuck, waterbuck, and an extraordinary diversity of bird life. Walk there in the early morning and you are walking through a system dense with mutualist relationships - arrangements of mutual benefit refined across evolutionary time.

The yellow-billed oxpecker riding the back of an antelope is one example of this. The bird removes ticks and other parasites the buck cannot reach; the buck provides a mobile foraging platform with a predictable parasite load. But the relationship runs deeper than the transactional. Oxpeckers function as an alarm system. Their hissing call and sudden flight from an animal's back is one of the earliest signals of a predator's approach - often more reliable than the direct observations of the ever-alert host animal itself, because the bird's elevation provides sightlines the ground-bound animal lacks.

The antelope does not consciously think: this bird serves my interests. But over evolutionary time, animals that tolerated and supported oxpecker presence survived at higher rates than those that didn't. The relationship is a form of biological social capital - a built-in network of trust and mutual benefit that enhances each party's resilience without costing either of them in any acute way.

What is instructive about mutualist, symbiotic relationships in ecology is precisely what Walker emphasises about social capital in human sys-

tems: it accumulates slowly, through consistency, and it is difficult to restore once broken. A host animal in the habit of chasing oxpeckers away - perhaps for being too irritating around wounds - does not easily re-establish the relationship. The trust infrastructure, once disrupted, requires time and repeated positive experience to rebuild. And during the period of disruption, the animal's early-warning system is compromised.

The Stoic Conception of Community

The Ancient Greek Stoics approached social capital through the concept of *oikeiosis* - the natural affiliation and extension of care outward from the self to others. Human beings are naturally disposed to form connections: first with themselves, then with family, then with community, then - in the Stoic cosmopolitan vision - with all of humanity. This was not sentiment. It was a recognition that the individual in isolation is radically less capable than the individual embedded in a network of trust and mutual obligation.

For the Stoics, friendship - genuine friendship, not convenience or flattery - was among the most important investments a person could make. Roman Stoic Seneca's letters to Lucilius are, among other things, a sustained commentary on this. He distinguishes sharply between those who collect associates for instrumental reasons and those who cultivate genuine friends: people who know your actual character, who will tell you what you need to hear rather than what you want to hear, and whom you trust enough to be known by. Such friendships, he argues, are not a luxury. They are a structural component of a life capable of absorbing serious disturbance.

Stoicism is so often misread as a hard philosophy of solitary self-sufficiency. It isn't. Epictetus taught in a school. The Roman emperor, Marcus Aurelius names, in his private *Meditations*, the specific people from whom he learned specific virtues - his grandfather, his father, his teachers. His list is not incidental. It is a record of the social capital that made him who he was.

Social Capital in the Special Forces Team

In Small Team tactics, social capital is not a desirable addition to operational capability. It is, in conditions of genuine stress, the primary determinant of whether the team functions - and survives - at all.

The reason is straightforward: in a high-stakes, rapidly evolving situation, there is no time to verify. The operator receiving a report from a teammate cannot pause to assess whether that teammate is accurate, honest, and competent. They act on the information communicated. If

the social capital in the team is high - if the track record of that teammate's judgement has been built through shared experience, through challenges navigated together, through the thousand small acts of reliability that constitute trust - then the team acts as a coordinated machine. If the social capital is low, an operator either hesitates at a moment that doesn't permit hesitation or acts on information he has no basis to trust.

Walker's observation about leadership applies here, particularly. The team leader who defaults to command-and-control in every situation - who cannot shift to distributed authority when the situation demands it, when the soldier closest to the ground has information that the leader lacks - is burning social capital with every such decision. Over time, teammates stop volunteering judgement they expect to be overridden. The network of distributed intelligence that is the team's greatest adaptive asset quietly atrophies. Then, the leader has a compliant team, not a resilient one.

Conversely, the team that has built genuine social capital - through the mundane, unglamorous work of showing up reliably, delivering on commitments, sharing discomfort without complaint, and extending trust before it is strictly necessary - possesses something that no training programme can manufacture in a hurry. It possesses the functional infrastructure for effective collective action under conditions that no plan has anticipated.

This is the irreducible truth about social capital that Walker identifies, and that the elephant matriarch embodies as second nature: it cannot be improvised at the point of need. It must be built before the need arrives, through the patient, unspectacular investment of constant practice.

Walk-On

Moving back through the riverine vegetation as the light thickens, a herd of buffalo moves through the Fever-tree forest ahead of us, unhurried. An oxpecker lifts momentarily from the shoulder of the lead animal, wheels in flight and settles again. A transaction invisible to the casual eye. A relationship ancient beyond reckoning.

The bush is not a collection of individuals competing in isolation. It is a web of obligations, debts, and mutual dependencies - most of them invisible, all of them load-bearing. Strip them away in the name of simplicity or efficiency, and you don't get a cleaner system. You get a more fragile one.

If you want to get hold of Andrew email: ecostaic@philosafaris.com - Safaris to the Wisdom of Nature - Philosophy means "love of wisdom" in ancient Greek, Safari means "journey" in Swahili.

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CONRAAD GEZA DE ROSNER - Founder and Director, K9 Conservation

The Hoedspruit community was shocked when it learnt of the passing of Conraad de Rosner, who died suddenly of a heart attack on 13 August 2026.

Conraad started in wildlife management in 1991, on the reserves of Zululand. He moved to Sabi-Sands, where he was appointed assistant anti-poaching manager in 2009.

In 2005 he got a Weimaraner puppy, Zingela, to keep him company on night patrols. That partnership became the foundation of his life's work: pairing trained dogs with trained rangers in the field. In 2010, Zingela tracked down Panjo, an escaped tiger, in Mpumalanga - the story that first put Conraad's name and methods on the map.

He went on to found K9 Conservation in 2011, at Thanda Game Reserve, landed contracts in the Sabi Sands which are still in place, and then moved its base to Hoedspruit in 2015. Over more than twenty years, his K9 units tracked poachers, detected snares, firearms and wildlife contraband, and located injured and orphaned animals for veterinary teams. He served as a police reservist with the Special Protected Species Unit and was a member of the Game Rangers' Association of Africa.

His book, *Called by the Wild: The Dogs Trained to Protect Wildlife*, tells that story in his own words.

He spent more than three decades in the field, standing between wildlife and the people who would kill it for profit.

He is survived by his family and by the K9 Conservation team he built. His dogs, his people and his projects remain at work. He was remembered at a memorial service attended by those who knew and worked with him.

Rest now. The dogs have got this.



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Lady Godiva's September Forecast: The Bill Comes Due



Lady Godiva

September doesn't ask things nicely. Whatever you've been avoiding since winter - the awkward call, the overdue decision, the promise you made yourself in a weak moment - it wants an answer now. The good news: most of you already know what to do. You've just been hoping someone else would do it first. Spring in the Lowveld means the bush is stirring, and so is everyone's

patience. This is a month for finishing things, not starting new ones. Half-built plans get exposed fast. If you've been coasting, September notices.

Virgo (23 August – 22 September)
Your season, and you've earned the right to be smug about it - quietly, obviously, because loudly would be undignified. The plan you've been perfecting in private is ready. Ship it before you "improve" it into oblivion again.

Libra (23 September – 22 October)
Balance is your whole brand, but this month someone's going to ask you to pick a side. Do it. The people-pleasing act is wearing thin on you before it wears thin on them.

Scorpio (23 October – 21 November)
You already know who's been lying to you. Stop gathering more evidence and act on what you've got. Restraint is admirable right up until it becomes an excuse.

Sagittarius (22 November – 21 December)
An invitation arrives that looks like fun and is actually a commitment in disguise. Read the fine print before you say yes with your whole chest, as usual.

Capricorn (22 December – 19 January)
Someone younger, louder, or less qualified is about to get credit for your idea. Speak now or spend Christmas being gracious about it, which we both know isn't your strong suit.

Aquarius (20 January – 18 February)
Your latest brilliant idea needs a budget, not just belief. Find the person who can say "no, but" instead of just "no" - they'll save the plan.

Pisces (19 February – 20 March)
You've been avoiding a decision by calling it "staying open to options." September closes a few of those options for you. Occasionally the universe just makes the call.

Aries (21 March – 19 April)
Patience isn't your gift, and this month doesn't hand you any extra. Something worth having is going to take longer than you'd like. Sulking about the timeline won't shorten it.

Taurus (20 April – 20 May)
Comfort has been your excuse for three months running. September asks what you're actually building, not just what you're avoiding disturbing. Move something.

Gemini (21 May – 20 June)
Everyone wants your opinion this

month, which is dangerous, because you have several and they contradict each other. Pick one publicly. Consistency, just this once.

Cancer (21 June – 22 July)
An old hurt resurfaces, uninvited. You don't have to relive it - you just have to notice it's finally small enough to look at directly. That's progress, even if it doesn't feel like it.

Leo (23 July – 22 August)
The spotlight moves on, and it stings more than you'll admit. Use the quiet to actually finish something instead of performing the finishing of it. The applause comes back.

Hot Tips for September
Deadlines don't care about your process. Finish the thing before you start the next thing. The overdue conversation gets easier the longer you avoid it - that's a lie you're telling yourself. Say the hard sentence first, explain it after. Watch who shows up when there's no audience. That's the version of them worth trusting. And if September feels like it's asking too much of you at once, it isn't - it's just calling in what you already agreed to back in autumn.

BUSINESS DIRECTORY

BUSINESS / SHOPS / SERVICES		EMERGENCY – HELP LINES	
Celestial Events	079 575 0900	After Hours Emergency Doctors	084 770 1741
FGASA	011 886 8245	Air Force Base Hoedspruit	015 799 2911
Fruitful Living	015 793 3703	Africa Safe -T	087 095 8911
Kruger2Canyon News	082 330 6060	HSP Ambulance	015 383 0650/
Koti Services	064 078 8408	Med OSH Consulting	078 672 0215
Suzuki Hoedspruit	010 825 9927	Alcoholics Narcotics Anonymous	082 258 4602
SPAR Hoedspruit	015 793 2305	Ambulance Airforce Base	015 799 2065
Tops @ SPAR	015 793 2069	Ambulance Services Limpopo	015 793 1581
Vehicle License Department	015 793 0838	Ambulance Services Swift	060 528 2784
Vision Fitness	082 040 1137	Fire Brigade AFB	015 799 2172
SCHOOLS & EDUCATION		Fire Brigade Maruleng	015 793 0536
Drakensig Laerskool	015 793 3756	Fire Dpt Hoedspruit	015 793 0728
Drakensig Pre-primer	015 793 2401	GKEPF Greater Kruger Enviro	
Hoedspruit Christian School	015 793 2067	Protection Foundation	065 743 2224
Lowveld Academy	015 793 3750	Hoedspruit Medical Rescue	072 170 0864
Mariepskop Laerskool	079 529 6071	Hoedspruit Paws	078 431 3161
Mariepskop Pre-primer	082 880 7069	HOEDSPRUIT FARM WATCH	072 310 0032
Perspective Training College	082 787 4471		072 077 7132
Southern Cross Schools	015 793 0590	Hospital Hoedspruit Pvt Hospital	012 000 1111/2/3
REAL ESTATE & PROPERTY		Hospital Emergency	012 000 1254
Century 21	015 793 1534	Hospital Nelspruit Mediclinic	013 759 0645
MEDICAL & VETERINARY SERVICES		Hospital Tintswalo	013 795 5000
Dr J Blignaut	083 410 0190	Hospital Sekororo Gvt-The Oaks	015 383 9400
Dr Ndlovu	015 793 1257	Hospital Tzaneen Mediclinic	015 305 8536
Dr A Polley	015 793 0606	Maruleng Municipality	015 793 2409
Dr Shivambu	082 465 8114	Medical Rescue	072 170 0864
Dr van Berge	079 531 6582	Med Centre Emergency No	084 770 1743
Dr Dabrowski	081 061 0313	Protrack	015 793 2585
Dr Kirstein	071 746 1059	SAPS Station Commander	082 565 8253
Dr D. Coertzen (Orthodontist)	072 490 7869	SAPS General	101 111
Dr du Toit (Pediatrician)	082 655 4738	SAPS	015 799 4000
Lowveld Dental (Dentist)	073 597 5174	SPCA Phalaborwa	071 519 7044
Dr L van Vuren (Dentist)	015 793 0845	Victim Support Unit	082 940 0651
Hlokomela	087 550 0387	CONSTRUCTION & INDUSTRIAL	
Hoedspruit Clinic	015 793 9000	Coastal Hire	015 793 0971
Hoeds Wildlife Est Pharmacy	015 793 1427	Mopane Group	015 781 1571
Lowveld Pharmacy	072 404 6142	On Tap Plumbing & Bathrooms	065 559 0157
HSP Pharmacy	015 793 2318	Discon	083 415 3186
Kyk Oogkundiges (Optometrist)	060 548 5387	TOURISM & THINGS TO DO	
Hoedspruit Animal Hospital	015 793 0797	Eastgate Airport	015 793 3681
Wildlife Safety Solutions	073 934 6156	Graskop Gorge Company	066 305 1572/3
		K2C Biosphere Region	015 817 1838
		Skyway Trails	013 737 8374

SUDOKU ANSWERS

3	7	9	5	4	8	6	1	2
4	6	8	7	2	1	9	5	3
5	2	1	9	6	3	4	8	7
1	4	5	2	3	9	8	7	6
7	8	3	6	1	5	2	9	4
6	9	2	4	8	7	1	3	5
8	1	4	3	5	6	7	2	9
2	3	7	8	9	4	5	6	1
9	5	6	1	7	2	3	4	8

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My 5 Sent

Oupa Bobbili

Veertig jaar staan skielik opsy so- dat nuwe skoene oor die drumpel kan loop.

Ja ek skryf nou 'n mooi gedagte aan twee steun pilare van die ge- meenskap, wat na veertig jaar se diens hulle tuig neerlê om die vrug- te van hulle harde werk te kan geni- et. Oom Pieter en Tannie Sonja het die vaandel oor gegee aan nuwe mense om hulle plek vol te staan.

Ek stap in die Apteek in en klaar is daar baie veranderinge, splinternu- we gesigte. Melane (Ek weet nie of die spelling reg is nie, jammer nooi) groet ons vriendelik soos altyd, maar die hartseer lê diep in haar

oë. Oom Pieter se stoel is leeg en Tannie Sonja loer nie oor die toon- bank nie. Toe skop realiteit in, hulle is op pensioen.

Die gemeenskap sal hulle onthou want hulle bly nog hier. Ons sal hulle sien brood en melk koop op pensioen dag soos al ons ander ou mense. Die nuwe garde in ons mid- de sal hulle deel doen ek weet dit. Hierdie is die harde realiteit en loop van die lewe. Jy werk hard, gee jou beste en dan gaan rus jy. Kort voor lank is jy net 'n gedagte in die bed- ryf.

Ons moet daarmee saam lewe, ons kan dit nie verander nie. Wat belangrik is wat jy saam met jou vat. Weet jy het eerlike werk gedo-

en, jy was lojaal, en het iets gebou wat ander nie kan nie. Dit is wat jy saam met jou vat. Dit is wat jou laat glimlag. Dit is jou eie legende.

Ek wil vir Oom Pieter en Tannie Sonja sê, julle het julle eie legende gebou. Wat julle vir die gemeens- kap beteken, sal niemand van julle kan wegvat nie. Julle sal nie gou vergeet word nie, julle sal nooit uit ons harte uitgaan nie. Geniet julle pensioen, gooi brandstof in daai Ford en ry hom tot die bande vir julle "Country Roads" sing. Waar julle kom weet dat julle elke oomb- lik, elke gedagte, en elke herinner- ing verdien.

Vir die nuwe mense wil ek net sê, moet asseblief nie probeer om

hulle skoene vol te staan nie. Julle het julle eie skoene, en ons as ge- meenskap vertrou julle sal dit kan volstaan. Ons wil hê julle moet julle eie skoene volstaan, sodat ons op julle sal kan vertrou soos wat ons Oom Pieter en Tannie Sonja vertrou het.

Uit met die oud en in met die nuwe, so loop die lewe. Ek weet ons gelief- de paar het oor gegee met 'n oop maar ook met 'n swaar gemoed. Dit is vir ons ook baie hartseer. Ons wens julle alle voorspoed, seëninge en baie liefde toe.

Groete

The Clockmaker Who Humiliated Science



Claude, Anthropic AI

There is a particular kind of injustice that history keeps repeating. A person of no formal standing, no academic title, and no institutional backing solves a problem that has defeated the greatest minds of the age - and is then made to wait, humiliated, while those same minds find reasons why the solu- tion cannot possibly be correct. John Harrison lived that injustice across four decades. And the problem he solved was not a small one.

For centuries, sailors could find their latitude - their position north or south - by measuring the angle of the sun or stars above the horizon. Reliable, proven, understood. But longitude - east-west position - was a different and far darker matter. As one moves east or west across lines of longitude, local time shifts by one hour for every fifteen degrees. The solution, in theory, was simple: carry an accurate clock

set to the time at a known reference point, compare it to local time at sea, and calculate the difference. In the- ory. The problem was that no clock in existence could survive a sea voyage with sufficient accuracy. Temperature changes caused metal to expand and contract. Humidity corroded mecha- nisms. The rolling of a ship defeated pendulums entirely. Ships navigated by guesswork, by prayer, and by the stars - and they died.

The scale of death was staggering. In 1707, a British naval squadron returning from Gibraltar made a catastrophic navigational error off the Scilly Isles. Four warships struck rocks and sank. Nearly 1,400 men drowned in a single night. It was not the first disaster of its kind, and it was not the last. In 1714, the British Parliament passed the Longitude Act, offering a prize of £20,000 - roughly equivalent to £3,4 million pounds in today's terms - to anyone who could solve the longitude problem to an ac- curacy of thirty nautical miles. It was

one of the largest scientific prizes ever offered. The greatest astronomers, mathematicians, and natural philoso- phers of the age set to work.

John Harrison was not among them. He was born in 1693 in Foulby, Yorkshire, the son of a carpenter. He had no for- mal education in science or math- ematics. He reportedly developed his fascination with clocks after being bedridden with smallpox as a child, spending his time studying a pocket watch his father had given him. He taught himself. He built his first clock before he was twenty. And when the Longitude Prize was announced, he quietly decided he would win it.

He spent forty-three years on the prob- lem. His first marine chronometer, H1, completed in 1737, weighed seventy- five pounds and required a case four feet square. It was extraordinary engi- neering, but not yet good enough. H2 and H3 followed - each one more re- fined, each one representing years of solitary obsessive work in a workshop, not a laboratory. And then, around 1751, Harrison made a conceptual leap that nobody saw coming. No one in the 1750s considered the pocket watch a serious precision timekeeper. Harrison decided to build one anyway.

H4 was completed in 1760. It resem- bled a large, ornate pocket watch. It measured five inches across. It ticked five times a second. In 1761, Harrison's son William sailed with H4 to Jamaica on HMS Deptford. Two months later, after a voyage across the Atlantic, H4 had lost just five seconds. Five sec- onds. On a rolling ship, through storms and humidity and the full hostility of the open ocean, across thousands of miles, a carpenter's son's pocket watch had found longitude to within one nautical mile. The prize conditions required thirty.

The Board of Longitude declared it a fluke and demanded a second trial.

On the second voyage in 1764, H4 gave a longitude error of ten miles. The Board still resisted, conceding only a partial payment of £10,000 (about £2,37 million pounds today). They de- manded Harrison dismantle his clocks

and hand over detailed drawings of their mechanisms. They proposed that the real solution to longitude was astro- nomical - the Lunar Distance method favoured by the scientific establish- ment - and that Harrison's watch was a clever trick, not a true answer. The As- tronomer Royal, Nevil Maskelyne, who sat on the Board, openly opposed Har- rison and was simultaneously tasked with evaluating him. The conflict of in- terest was brazen. Harrison was eighty years old.

It took a direct appeal to King George III - who tested H5 personally and de- clared it excellent - before Parliam- ent finally intervened. In 1773, eighty years old and exhausted, Harrison received a final payment of £8,750 (roughly £1,74 million today) - never formally awarded the prize but compensated by Parliamentary act. He died three years later.

The establishment had spent over a decade trying to explain away a solu- tion that worked perfectly because it had come from the wrong kind of per- son. A copy of H4 - called K1, built by watchmaker Larcum Kendall - sailed with James Cook on his second great voyage. Cook called it "our faithful guide through all the vicissitudes of cli- mates." The watch that the Board of Longitude spent years refusing to ac- cept was simultaneously being used to map the world.

There is a postscript worth noting. The marine chronometer that descend- ed from Harrison's work eventually equipped every serious vessel on every ocean. It made modern global trade possible. It made accurate charts pos- sible. It made safe passage possible for every ship that followed. The Longitude Problem - the problem that had killed sailors for centuries, that had defeated the greatest scientific minds of the age, that had prompted Parliament to offer a fortune for its solution - was solved by a man who learned to make clocks by himself, in Yorkshire, because he once had nothing to do while sick but study a pocket watch.

The right answer does not always come from the right address.



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