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UCT academics propose use of electrical blackouts to determine impact of artificial light on wildlife

A thought-provoking article published on Tuesday, 21 May 2024 in the journal *Trends in Ecology and Evolution* proposes the use of electrical blackouts, such as those experienced during loadshedding in South Africa, to enhance our understanding of how artificial light in urban areas may be affecting wildlife behaviours.

Artificial light at night, known as ALAN among urban ecologists, has become ubiquitous worldwide, with a notable increase in recent years. Alarmingly, this widespread illumination has deprived an estimated two billion people of seeing the sight of the Milky Way. Furthermore, research indicates that ALAN can profoundly influence the behaviours of urban-dwelling animals.

The article, titled "Harnessing Blackouts: A Unique Opportunity to Understand Wildlife Responses to Artificial Light," is authored by researchers from the University of Cape Town's (UCT) FitzPatrick Institute of African Ornithology, in collaboration with the University of Witwatersrand and the University of Glasgow. It brings attention to a remarkable research opportunity which currently exists in South Africa.

While blackouts are often seen as disruptive to human activities, the article suggests that they can be used as natural experiments that provide researchers with a controlled environment to study the absence of artificial light and its implications for wildlife behaviours.

UCT's Associate Professor Arjun Amar, lead author of the article, underscores the importance of recognising blackouts as a unique opportunity for global research collaboration. Professor Amar said: "We are keen to highlight this opportunity to the global research community and we hope to encourage international collaborators to come to South Africa and work with our researchers."

Within South Africa, Eskom, the parastatal in charge of supplying electricity, is increasingly unable to supply enough electricity to meet the demand and so has introduced load-shedding – scheduled blackouts – which usually last a couple of hours. The study shows that these blackouts are already visible from space in some South African cities.

Professor Amar emphasises that blackouts significantly reduce ALAN, which can be quantified using remote satellite data. The study reports a decrease by as much as 13% in night-time radiance in some South African cities during load-shedding periods, indicating a tangible impact on light pollution levels. Professor Amar states that "radiance levels in Johannesburg have fallen from a monthly average of 15.6 (nanowatts/sr/cm2) in 2014-2018, a time with little loadshedding, to a monthly average of 12.6 (nanowatts/sr/cm2) during 2022-2023, when loadshedding has been a common occurrence".

The article emphasises that blackouts offer researchers a rare chance to compare animal behaviours in areas with and without artificial light within the same landscape and timeframe. By quantifying the reduction in ALAN during blackouts using remote sensing data, researchers can investigate short-term behavioural responses of wildlife, including movement patterns, foraging behaviours, and species interactions.

Despite certain limitations, such as risk of crime when conducting research at night in South African cities, the article encourages researchers to explore the myriad research possibilities presented by blackouts. The authors suggest international collaboration to capitalise on this unique research opportunity by combining the skills of researchers from the global north who have more experience studying ALAN, with researchers in South Africa who have intimate knowledge of the animal species that occupy their urban habitats.

Photos

Two photos of Cape Town taken a few seconds apart – showing the impact that 'load shedding' can have on Artificial Light at Night (or ALAN) in cities, and the opportunity for researchers to study its impact of urban wildlife. Photo: Eric Natham

- **Read the study**

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