

SAWMA CONFERENCE 2026



**Cradle Moon Lakeside Game Lodge
Muldersdrif, Cradle of Humankind**



**Tshwane University
of Technology**

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30 August – 4 September 2026



**Beyond Numbers: Clarifying the Goals of Wildlife
Management and Conservation**

ABSTRACTS

*Abstracts are presented in the same order as the programme (visit <https://sawma.co.za/conference/>
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MONDAY, 31 August 2026

Theme: Multiple values of wildlife: ecological, social, cultural,
and economic

K1

Keynote: UNESCO Biosphere Reserves – aids or impediments to management

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The venue for the 2026 SAWMA Conference lies within two globally significant sites, both recognised under UNESCO conventions. One is the renowned Cradle of Humankind World Heritage Site inscribed in 1999, the other is the Magaliesberg Biosphere Reserve, established under the UNESCO 'Man and the Biosphere' Programme in July 2015. In this address I will clarify the distinction between the two and briefly explain how the guidelines from the UNESCO World Network of Biosphere Reserves (WNBR) affect science, research and management practices. The main focus of the presentation will be the three interacting factors that make the Magaliesberg Biosphere unique: first, is the remarkable geology juxtaposed between the world's richest goldfields and the richest platinum deposits; the second is the extensive biodiversity at the interface between the grassland and savanna biomes; the third is the deep-time anthropology that places this region at the forefront of human evolutionary studies. This extraordinary combination offers important opportunities for multi-disciplinary and cross-disciplinary research and management across ecological, social and economic values. South African legislation does not designate Biosphere Reserves as legally protected areas, so their conservation and management depend entirely on 'soft law' methods such as partnerships, negotiation, and collaboration with stakeholders. This flexibility can be regarded as both a benefit and a challenge. In situations where many communities feel marginalised by 'fortress conservation' initiatives, the flexible Biosphere model has advantages. However, the inherent weakness is that no specific law safeguards the region from malpractice. I will discuss the concerns that face the management of the Magaliesberg Biosphere Reserve and some of the lessons being learned from 'soft law' procedures.



F1

**Counting Baboons, Understanding Perceptions:
Integrating Local Knowledge into Population Assessments**

Paula Pebsworth¹ and Lourens Swanepoel²

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Presenter: Paula Pebsworth; paula.pebsworth@gmail.com

Conservation and wildlife management often rely on population metrics such as abundance and density to guide decision-making. However, these measures alone may overlook the lived realities of human–wildlife interactions. This study integrates ecological survey data with local knowledge to examine chacma baboon (*Papio ursinus*) populations in Limpopo, South Africa, revisiting a study conducted approximately 50 years ago. Using line transect distance sampling and aerial surveys, we estimate current population density and distribution, while semi-structured interviews with farmers and residents provide insight into perceptions of baboon abundance, behavior, and conflict.

Preliminary findings suggest that baboon distribution has expanded since the original study period. Many respondents also report a perceived increase in baboon presence, along with heightened crop loss and property damage. These perceptions appear closely linked to reported behavioral shifts, including increased use of human-modified landscapes and reliance on anthropogenic food sources. Together, these patterns indicate that conflict may be influenced not only by changes in population size, but also by shifts in spatial use and behavior.

This study underscores the value of integrating quantitative ecological data with qualitative social insights to better understand and manage human–wildlife systems. Moving beyond population counts to include local experience allows for more nuanced interpretations of change and can support management strategies that address underlying drivers of conflict while aligning conservation goals with community perspectives.

**F2****Integrating ecological knowledge and practical management strategies to support insectivorous bats in Australian macadamia orchards****Rani Davis¹, Michael Furlong¹ and April Reside¹***¹School of the Environment, the University of Queensland, St Lucia, Queensland, 4072, Australia*Presenter: Rani Davis; Rani.davis@uqconnect.edu.au

Agricultural practices drive biodiversity loss globally, simplifying ecosystems and weakening natural pest control. Insectivorous bats consume over 200 agricultural pest species, yet farming practices can suppress their activity; therefore, supporting bats in farmland could help address biodiversity loss and improve sustainable pest management. Macadamia is a high-value Australian native crop, where pesticide reduction is a priority, but knowledge gaps hinder adoption of alternatives. In South African macadamia orchards, bats reduce nut damage by 35%, providing pest suppression valued at US\$57-139/ha/yr, yet their role in most Australian cropping systems remains unexplored.

This research addresses foundational ecological knowledge gaps of insectivorous bats in Australian macadamia orchards and investigates low-intensity management interventions for broad-scale implementation. Across six orchards, acoustic monitoring, invertebrate surveys, and DNA metabarcoding of bat scat assessed whether bat activity or diet tracks spatio-temporal variation in pest abundance - a key uncertainty for evaluating bat-mediated pest suppression. Results confirm bats consume macadamia pests, with activity highest at orchard edges and remnant vegetation, and with pest abundance. However, bat activity was low in orchard centres, suggesting canopy structure may restrict bats' pest-suppression services within orchard interiors.

Ongoing work quantifies how orchard canopy openness influences bat activity and richness, aiming to refine tree trimming regimes to optimise flight space for bats. Artificial-roost experiments will test whether supplementing roosts increases bat activity and reduces invertebrate abundance using a before-after control-impact design. This presentation will highlight how baseline ecological understanding guides targeted interventions and underscores the importance of experimentally testing these actions in agricultural landscapes.

**F3****High diversity of bats in the Soutpansberg foothills emphasizes their ecosystem role in supporting natural pest control within citrus orchards****Lourens Swanepoel^{1,2}, Sean Moore³ and Khavheli Thivheleli¹**

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Presenter: Lourens Swanepoel; lourens.swanepoel@univen.ac.za

The Soutpansberg supports a highly diverse mammal community, with bats particularly species-rich (44 recorded species) and functionally important in agricultural pest suppression. Previous research has largely focused on mesic regions; this study addresses the drier northern foothills near the Tshipise citrus production hub (Limpopo Province). The study aimed to (i) assess bat diversity within citrus-dominated landscapes, (ii) identify environmental drivers of species richness and activity, and (iii) characterise bat diets using next-generation sequencing.

Using combined live-trapping and acoustic monitoring, 33 potential bat species were detected. Bat species richness exhibited a significant negative interaction between mean nightly temperature and landscape heterogeneity, indicating that the positive influence of temperature weakened in more homogeneous orchard-dominated systems relative to natural habitats. In contrast, bat activity showed a significant positive interaction between temperature and landscape heterogeneity, with activity increasing most strongly within orchard environments. Among functional guilds, only clutter-edge foragers demonstrated a significant response to insect biomass.

Dietary analysis indicated that Lepidoptera (33%) and Diptera (29%) dominated prey composition, followed by Araneae (18%) and Coleoptera (9%). Other orders, including Psocoptera (5%), Hymenoptera (4%), Hemiptera (1%), and Trichoptera (1%), were less frequent. Of the molecular operational taxonomic units (MOTUs) identified, 35% were classified as agricultural pests, including 23% specifically associated with citrus, while 20% represented predatory taxa.

These findings demonstrate that bat assemblages in the Soutpansberg foothills remain diverse within agricultural matrices, with temperature and landscape context jointly structuring ecological responses. The high prevalence of pest taxa in bat diets underscores their functional importance in supporting ecosystem service delivery within citrus production systems.

**F4****Economic vs. ecological value: Management motivations for bontebok (*Damaliscus pygargus pygargus*) and Cape mountain zebra (*Equus zebra zebra*) on private wildlife ranches in South Africa****Karlin L. Jacobs¹, Brian K. Reilly¹, J. Paul Grobler¹ and S.A. Jeanetta Selier^{2,3}**¹*University of the Free State, Bloemfontein, South Africa*²*South African National Biodiversity Institute (SANBI), Pretoria, South Africa*³*Extraordinary Research Fellow, Faculty of Law, Northwest University*Presenter: Karlin Jacobs, 2028509491@ufs4life.ac.za

Wildlife in South Africa's private conservation landscape embodies multiple, often competing, values that extend beyond ecological function to include social and economic dimensions. This study explores these value systems through qualitative data from an online questionnaire (n = 33) distributed to private wildlife ranchers managing bontebok (*Damaliscus pygargus pygargus*) and Cape mountain zebra (*Equus zebra zebra*). The research contributes to a better understanding of how policy, legislation, and market dynamics influence the sustainable use of these endemic subspecies. Thematic analysis reveals that respondents attribute diverse and overlapping values to both subspecies. Ecological importance and conservation significance were widely recognised (40%), whereas purely economic value was less frequently cited (24%). A relationship is evident between respondents' primary revenue-generating activities and their motivations for keeping these subspecies. Respondents deriving most income from ecotourism more frequently emphasised conservation and aesthetic values (86%). However, these patterns are not consistent. A notable subset (73%) reported conservation-oriented motivations, such as subspecies protection and biodiversity management, alongside economic motivations, despite generating most income from trophy hunting and/or wildlife breeding. Comparisons suggest subtle differences between species, with bontebok more frequently associated with mixed economic–ecological values, while Cape mountain zebra is more often framed in ecological terms; however, overall patterns remain overlapping. This highlights the complexity of wildlife value systems, where economic and ecological motivations coexist. Despite recognised ecological importance, respondents reported declining economic viability due to policy and regulatory constraints, which may influence management decisions. Follow-up in-person interviews will further explore these dynamics.

**F5****Reconciling conservation values: Rhinos as a case study****Michael 't Sas-Rolfes¹***¹ African Wildlife Economy Institute, Stellenbosch, South Africa*Presenter: Michael 't Sas-Rolfes; mtr25@sun.ac.za

Appropriate recognition, reconciliation, and capture of diverse human values is essential to effective conservation, as demonstrated by well-documented cases of Africa's two rhinoceros species. Drawing on several recent studies that examine a rich data set spanning more than five decades, I consider how variable success in rhino conservation may be explained by value-related elements. I outline an inclusive transdisciplinary theory of value and relate it to the contemporary institutional and governance literature, highlighting property right regimes as a key factor. A property and benefit matrix analysis of rhino values yields the testable hypothesis that conservation policy grounded in institutional diversity will optimize social values and deliver the best overall rhino conservation outcomes. This approach further emphasizes the significance of realising values at relevant local scales and illuminates how and why African rhino conservation performance has varied between countries and why South Africa currently stewards the world's largest populations of both African rhino species. A further historical analysis relating policy changes to values and conservation impacts in South Africa provides additional insights. Highlighting the critical role of value conflict in shaping policy, the presentation concludes by outlining possible social-ecological outcomes of future policy changes targeting activities such as rhino safari hunting and the rhino horn trade.

**F6****Responsible management and sustainable use of large herbivores in protected areas**

N. Maruping-Mzileni¹, H. Bezuidenhout², C. Bissett¹, L. Brown², C. Greaver¹, J. Hayes¹, M. Herbst¹, A. Ramoelo³, L. van der Vyver-Moolman¹, E.M. Daemane¹, I. Smit¹ and S.M. Ferreira¹

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Presenter: Nkabeng Maruping-Mzileni, Nkabeng.mzileni@sanparks.org

Biodiversity carries a variety of values, some of which protected areas safeguard from various threats. Protected areas, however, are seldom fully intact ecosystems. Various global environmental change drivers influence biodiversity even within protected areas, including fenced protected areas containing large terrestrial animals where larger-scale processes (e.g. migration) are often impeded. Authorities use ecological management to maintain, restore or mimic ecological processes when managing a gradient of largely intact to degraded protected areas. The restoration of ecological process through mimicking the outcome of such dynamics, provide a multitude of opportunities that can contribute to various initiatives such as other conservation programmes or transformation and growth of a diverse wildlife economy. Large relatively intact parks and robust large-bodied wildlife populations, provide opportunities to contribute towards sustainable use principles. Sustainability does not influence the persistence of the resource as well as the dynamic role it plays in ecosystems. We developed a framework and provided the descriptions of models that direct ecological removals for management purposes as well as harvesting for economic purposes within an acceptable risk threshold. This framework uses a combination of static and dynamic models as simplified representations of real-world scenarios based on empirical data, and integrates time series of wildlife population estimates, remote sensing derived vegetation trends, field-based vegetation condition and tacit knowledge of managers. This allows authorities to mimic natural processes in degraded systems with limited restoration potential and effectively mitigate risks associated with utilisation of wildlife. Our approach embraces inclusive conservation ideologies and provides a framework through which African conservation agencies illustrate due diligence.



F7

Balancing culture and conservation: understanding and addressing the use of wild felid parts in South Africa

W. Andrew Taylor¹, Nomsa Sibeko², Tristan Dickerson¹, Marine Drouilly¹, Beckie Garbett¹, Wian A. Nieman¹, S. Viljoen¹, & Gareth Whittington-Jones¹

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Presenter: Andrew Taylor, ataylor@panthera.org

Wild felids in South Africa hold significant cultural value, featuring in traditional medicine, attire, and ritual practices. These uses intersect with the illegal wildlife trade (IWT), posing considerable challenges to conservation. Here we consolidate findings from multiple lines of research to better understand the cultural uses of wild felid species across South Africa and identify potential solutions that conserve both wild populations and cultural practices. Engagements with traditional healers across multiple provinces have documented which felid species and body parts are used, how and from where they are sourced, and how felids are valued by the healer community. Most felid species are used, with fat, skins, phalanges, teeth, and claws used for spiritual, medicinal, and ceremonial purposes. Trade is driven by cultural practices and socio-economic need, while parts are commonly sourced through poachers, *muthi* markets, game farms, and cross-border trade networks. Although the number of felids directly affected has not been estimated, the widespread nature of the trade suggests substantial impact. Further impacts on felid populations are demonstrated by Panthera's 'Furs For Life' project, which has engaged extensively with cultural groups whose members use felid skins for ceremonial attire. Together, these findings illuminate the complex nexus between cultural use, livelihood dependence, and conservation threat. Under current legislation, all cultural users face a lack of legal access to felid parts, making it critical to develop sustainable, culturally sensitive, and locally driven interventions that reduce pressure on wild felid populations while acknowledging community needs.



F8

Behavioural Ecology of Brown Hyenas (*Parahyaena brunnea*) in Northern Namibia**Karen Codling¹, Susanna Lewis de Amable¹ and Paul Kasko²,**¹ *AfriCat Foundation, Otjiwarongo, Namibia*² *Technical University of Munich, Munich, Germany*Presenter: Karen Codling; coordinator@africat.org

Research initiated in 2019 within a private, enclosed reserve in northern Namibia documented a high population density of 24 individuals per 100km². Six distinct clans and at least one nomadic individual utilized 92% of the reserve, exhibiting an exceptionally small mean home range of 37km². Notably, this study recorded the first evidence of infanticide in this species.

Reactivated in 2023, the current study in the same Reserve utilizes camera traps, GPS telemetry, and genetic analysis to assess long-term population dynamics. Preliminary findings indicate well-defined home ranges with high intra-clan overlap but minimal inter-clan permeability. While territorial stability is high, temporal shifts in home ranges and female dispersal—including one instance of emigration to adjacent farmland—have been observed.

The high population density is likely supported by the Reserve's protected status and a commensal relationship with leopards. Brown hyenas frequently scavenge from leopard kills; however, emerging data suggests they also engage in active predation, a behavior mirrored in populations in the Sperrgebiet region.

The AfriCat Foundation's research highlights the adaptive plasticity of *P. brunnea* in enclosed ecosystems. The synergy of high leopard density and limited human interference appears to facilitate compressed home ranges and elevated population densities. These findings challenge the perception of brown hyenas as exclusive scavengers and underscore the importance of protected corridors for dispersing individuals to mitigate human-wildlife conflict on neighbouring farmlands.

**F9****A progressive, yet fragile South African conservation model****Peter J. Mills¹, Brian K. Reilly¹ and Paul J. Grobler¹**¹ *University of the Free State, Bloemfontein, South Africa*Presenter: Peter John Mills; peterjm@mweb.co.za

This paper contains reflections from the findings of the research project that unpacked the perceptions of the South African conservation fraternity and how these have supported the nation's conservation program. The study necessitated a comprehensive interrogation of the history and growth of the conservation ideology and practice in the country. What emerged was a unique South African model that allowed for the private ownership of wildlife, that, apart from government, has allowed the private sector and corporate institutions access to the country's growing wildlife/biodiversity economy. This, together with other Southern African Development Community (SADC) countries, have developed progressive models that also allowed communities access to the wildlife enterprise. A much-criticized practice by the strangely conservative, but strong, supporters aligned with compassionate conservation and the deep ecology lobby. This hybrid South African model has both the government and private sector contributing, not necessarily in equal part, to the exponential growth in the countries conservation estate and towards an increasingly lucrative wildlife/biodiversity economy. These gains are outweighed by weak institutional frameworks, limited enforcement capacity, and fragmented accountability mechanisms. Crumbling infrastructure and declining capacity within the Provincial conservation agencies amounts to nothing more than a dereliction of duty, together with declining budgets, are an indication of indecisive leadership and the lack of political will. The entry of poorly tertiary trained graduates, into increasingly dysfunctional government institutions merely exacerbates the situation. In the face of a growing national call for development greater pressure on the wildlife resource is both expected and unavoidable. Such burdens are not allowing conservation planners enough latitude to oversee a measured ecological transition of the socio-ecological landscape without losing biodiversity. The common cry from the conservation fraternity is for reformatory change, but given the afore mentioned constraints, these calls are unlikely to be realised and the persistence of species, in their current state, cannot be assured.



S1

Sustainability at the Crossroads: Integrating Social, Environmental, and Economic Dimensions in Africa's Wild Meat Value Chains**Kumbirai Takawira¹, Wiseman Ndlovu^{1,3}, Melissa van der Merwe², and Frank Vorhies¹**¹*African Wildlife Economy Institute, Stellenbosch University, Stellenbosch, South Africa*²*Department of Agricultural Economics, Faculty of AgriSciences, Stellenbosch University, Stellenbosch, South Africa*³*Department of Conservation and Entomology, Stellenbosch University, Stellenbosch, South Africa*Presenter: Kumbirai Takawira; 27275299@sun.ac.za

Africa's wild meat value chain plays a critical role in supporting livelihoods, income, and food security for millions of people. However, the wild meat sector faces growing sustainability concerns due to unsustainable extraction. While the current concerns and sustainability approaches in wild meat value chains are primarily focused on landscapes or harvesting stage, these issues are complex, multifaceted and spread along Social, Economic and Environmental (SEE) fabric or architecture of societies involved. Failure to entrench sustainability in the industry, partly explains why there is hesitance to legalise sector in Africa and beyond. Tackling this is important towards a sustainable wild meat sector. This study maps the wild meat value chain and systematically SEE sustainability challenges and opportunities across its key stages. The study conducted a systematic literature review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, yielding 122 relevant publications. The findings highlighted that the informal wild meat value chain is complex, constituted by interlinked stages (production, hunting, processing, and markets), each characterised with unique sustainability issues. The production/harvesting and hunting stages emerged as the most environmentally risky due to overextraction and biodiversity loss, while the processing and market stages pose heightened social and economic sustainability risks such as labour exploitation, zoonotic disease exposure, lack of traceability systems, underdeveloped markets, seasonal supply fluctuations and limited value addition. This demonstrates the uneven distribution of sustainability challenges across the value chain calling for stage-specific corrective measures. The study identified sustainability focused value chain upgrading opportunities for each stage. This study provides a structured, value-chain-based understanding of sustainability risks and opportunities in the wild meat sector, promoting the development of sustainability indicators.

**S2****Economic valuation and spatial distribution of selected medicinal plants in Nokaneng, Okavango Delta, Botswana****Kenanao Mokoba¹ and Goitseone Mmopelwa²**¹*University of Botswana (ORI)2, Maun, Botswana*²*University of Botswana, Gaborone, Botswana*Presenter: Kenanao Mokoba; 201601896@ub.ac.bw

Medicinal plants are a primary component of the traditional health system, particularly in developing countries. Despite their significance to human health and the economy, their availability is threatened by rising demand, population growth, unsustainable harvesting, and habitat conversion to other land uses. Furthermore, these plants are often abundant in poorly known habitats, and their economic value is frequently not quantified, leading to an underestimation of their importance. The objective of the study was to map the spatial distribution and estimate the economic value of key medicinal plants. Participatory mapping and questionnaires were used to collect data, where the payment card method was used to solicit the premium households are willing to pay for the bequest value of medicinal plants. Spatial analysis was used to analyse spatial data, while opportunity cost was used to estimate direct use value, and willingness to pay was used to estimate bequest value. Regression and thematic analysis were also employed. The results demonstrate that 11 medicinal plants across 7 families are deemed key and are heterogeneously distributed owing to settlement and environmental factors. The estimated opportunity cost of harvesting is P271.80 (USD\$20.27) per trip, while the average willingness to pay is P96.20 (USD\$7.17) per annum. Direct use value is P56,534.40 (USD\$ 4,216.33) and bequest value is P18,470.40 (USD\$1,377.52) per annum. The study contributes to the sustainable management of medicinal plants.



S3

Functional mammalian diversity across a gradient of elephant densities in the Eastern Cape, South Africa**Shantel W. Malebe¹, Gareth Nuttall-Smith¹ and Daniel M. Parker¹**¹UMP-Oppenheimer Research Chair in Biodiversity Conservation, University of Mpumalanga, Mbombela, South AfricaPresenter: Shantel Winnie Malebe; 220362564@ump.ac.za

African elephants (*Loxodonta africana*) are megaherbivores (i.e., they exceed 1000kg) that can alter the structural habitat of the environments they inhabit. However, despite speculation that increases in elephant densities may be connected to habitat change and an overall loss of biodiversity, very little work has been conducted to experimentally test such a hypothesis. Our study investigated the relationship between elephant density and functional mammal diversity across nine, fenced reserves in the Eastern Cape province, South Africa. We sampled each site using camera traps (n = 3 per site) over a period of a year between 2016 and 2017. Mammalian species richness was significantly different across the sites, with higher species richness being found at sites with lower elephant densities. Species richness across the 27 sites ranged from 8 to 32 species, while elephant abundance ranged from 0 to 29 per site. Our findings indicate that elephant densities have an impact on mammalian communities in the Albany Thicket.



Theme: Ethics, responsibility, and legitimacy in wildlife interventions

F10

Science vs social media: When evidence is overtaken by narrative

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In late 2024, elephant mortalities in Madikwe Game Reserve, South Africa, triggered intense attention in mainstream and social media. Public commentary characterised the reserve as an ecological “wasteland”, allegedly resulting from drought, mismanagement and an overabundant elephant population. These claims were amplified by animal welfare groups, private organisations, and some internal stakeholders, generating concern among tourism operators over reputational damage and potential financial losses. In response, an on-site assessment was undertaken to evaluate the extent and severity of the reported impacts. Drawing on established field-based assessment methods and long-term familiarity with the reserve, the investigation found that although drought effects and elephant impacts were locally significant, their reserve-wide extent had been substantially overstated. The findings did not support claims of imminent system-wide ecological collapse. A follow-up visit in early 2025 was consistent with these conclusions. Herewith a presentation of the assessment methodology and findings, including both adverse and stabilising ecological indicators, provide a more balanced interpretation of conditions in Madikwe Game Reserve. Beyond the site-specific case, the paper examines how emotionally charged and weakly scrutinised narratives can distort public understanding, influence stakeholder behaviour, and complicate management responses in protected areas. The case highlights the importance of evidence-based interpretation, proportionality in ecological communication, and ethical responsibility in shaping wildlife management discourse where conservation, tourism, and public perception intersect.



F11 **Stop managing a fantasy**

Sam Ferreira^{1,2,3}

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Presenter: Sam Ferreira; sam.ferreira@sanparks.org

Conservation loves a neat number. Carrying capacity, equilibrium, “how many is too many?” They sound tidy, decisive, and reassuring. The problem is that nature rarely behaves so politely. In open, dynamic systems, the evidence is clear: it’s not the number of animals that shapes ecosystems, but what they do. Where they move, how long they linger, and how they use water, food, and refuge create patchy, ever-changing landscapes. Counting heads can miss the plot entirely.

I flip the script. Our relationship with wildlife is ecological first, moral second. People and animals share space, resources, and risks, and the outcomes we see follow biophysical processes, not good intentions. Yet conservation debates are often driven by moral claims. These matter, but they come with a twist: stakeholders can argue freely, while decision-makers carry the legal burden. Decision-makers must justify actions with evidence, reason, and proportionality. The risk sits squarely with those who act. And here’s the second twist: ecosystems respond to ecological pressures, not to arguments.

So, what now? Instead of asking what a system should look like, we should ask what processes must continue. From there, a practical pathway emerges that set clear objectives, understand how species behaviour affects them, choose actions, weigh risks, and seize opportunities. It’s not primarily about morals or perfect answers. It’s about navigating ecological realities and making honest trade-offs in a messy, real world.

Beyond numbers is not just a slogan, it’s a shift in thinking. If we follow the processes that matter, we stop managing a fantasy and start managing reality, where humans are simply another consumer, whether predator or competitor.



F12

Lead, venison, and vultures: why lead-free matters

Justin W. Henry¹

¹ BirdLife South Africa, Johannesburg, South Africa

Presenter: Justin Henry, justin.henry@birdlife.org.za

Vultures play a vital ecological role in maintaining ecosystem health by removing carrion from the landscape. As nature's clean-up crew, these iconic scavengers limit the spread of disease and recycle nutrients. Despite their importance, vultures are amongst the most threatened bird groups globally due to poisonings, habitat loss, collisions and illegal trade. Their absence in habitats represents a biodiversity crisis and a risk to public health. Unintentional poisoning from lead-based ammunition is a significant risk to this highly threatened group.

BirdLife South Africa has been at the forefront of research into lead poisoning in South Africa's *Gyps* vultures, identifying lead-based ammunition as the source of exposure. Building on this work, the project has expanded to include ballistic testing to assess the effectiveness and performance of lead-free alternatives.

The impacts of lead poisoning on vultures are examined alongside evidence of lead contamination in commercially available venison, highlighting the broader environmental and human health implications of lead-based ammunition. The effectiveness of lead-free ammunition as a practical alternative is evaluated through ballistic performance testing and field-based demonstrations. Ongoing engagement with ammunition manufacturers, hunting organisations, conservation agencies, protected area managers and the game management sector demonstrate how collaborative, science-based approaches can accelerate the transition to lead-free ammunition, reducing lead exposure in vultures and other scavenging wildlife while supporting sustainable wildlife management.



F13

Freedom of movement: Tracking the success of rewilded and translocated elephant bulls through collar data

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Presenter: Tamara Eggeling; tammy@elephantreintegrationtrust.co.za

Literature has proven that adaptability and flexibility in movement behaviour are key indicators of evaluating the outcome of certain management interventions, such as elephant translocation or rewilding. There is a relative paucity in research that has investigated the impact of these management tools through exploring the long-term movement behaviours of long-lived species such as elephants. This study was designed to add to the body of literature by assessing the adaptations exhibited by the rewilded and translocated individuals when exposed to a novel environment, whilst simultaneously assessing the impact of the introduction of wild bulls on resident rewilded bulls. The results reflected that the rewilded bulls established ranges comparable to those of wild elephants both when they were released and after more than four years of free ranging movement, prior to the introduction of wild bulls. Even though we reported significant differences in travel distances when we compared the latter after release to when they had been roaming free for four years, only small adjustments in range use were observed during these two periods. In contrast, large variations were noted in the rewilded bulls' range use sizes and areas they utilized after the wild bulls were introduced to the reserve. Thus, the introduction of the wild bulls had a significant effect on the rewilded bulls' movement ecology. Furthermore, the wild, translocated bulls implemented unique adaptation strategies, and it was evident that they were able to establish ranges that exceeded the available space at their capture sites. Lastly, the study concluded that the ever-changing shift in reserve utilization observed for all the bulls on the reserve across the study years may point towards a more sustainable way of utilising the reserve during different environmental conditions.

**F14****Managing growth in a fragmented landscape: Population dynamics of the South African managed cheetah metapopulation****Kelsey Smit¹, Olivia Sievert¹, and Marna Smit²**¹ *Endangered Wildlife Trust, Johannesburg, South Africa*² *Ashia Cheetah Conservation, Paarl, South Africa*Presenter: Kelsey Smit; kelseyb@ewt.org

Before the formal establishment of a managed metapopulation, cheetah reintroductions into South Africa were largely opportunistic and uncoordinated. Between 1965 and 1998, at least 188 conflict cheetahs from Namibia were released into nine reserves, but populations persisted in only two. A coordinated metapopulation strategy proposed in the mid-1990s, together with the cessation of further imports from Namibia, marked a shift toward structured, science-based management across fenced reserves.

Between 1999 and 2009, additional animals were sourced from farmland conflict removals, helping establish the current system. By 2012, the population had declined to ~180 animals on 44 reserves, largely due to unregulated removals, contraception, and trade to captivity, highlighting the risks of decisions made without coordination. Following the adoption of a code of ethics and cooperative planning among reserve managers, the population has increased by 8.8% annually since 2012. By December 2025, the managed metapopulation comprised 70 reserves (~15,000 km²), supporting 298 adults, 73 dispersers, and 169 cubs.

A long-term dataset (2012-2025) compiled life-history data for 1,987 individuals, including birth, mortality, and translocation records. These data show that persistence depends not only on population size, but on coordinated governance, genetic connectivity, and adaptive management. As the metapopulation expands, priorities include strengthening genetic management, increasing connectivity through translocations, and refining population viability models to guide transparent, evidence-based decision-making.

This system demonstrates how managed metapopulations can provide a practical conservation framework for wide-ranging, low-density species in fragmented landscapes, offering a replicable model for sustaining viable carnivore populations where continuous habitat is no longer available.



TUESDAY, 1 September 2026

Theme: Wildlife Management

K2

Keynote: Conflict, land and legitimacy: Governing coexistence in Zimbabwe's mixed-use wildlife systems

Diana Tsitsi Marewangepo-Chasara¹

¹Zimbabwe Parks and Wildlife Management Authority, Harare, Zimbabwe.

Presenter: Diana Tsitsi Marewangepo-Chasara, dmarewangepo@zimparks.org.zw

Human-wildlife conflict in Zimbabwe is escalating, with recent evidence pointing to a marked rise in fatal encounters, concentrated geographically and driven primarily by large dangerous species. While technological responses such as satellite collaring and early-warning systems are improving real-time conflict management, this presentation argues that conflict trends cannot be durably resolved by treating them as an isolated biological problem. Habitat loss and fragmentation linked to resettlement and agricultural expansion have measurably reduced wildlife carrying capacity across several significant conservation landscapes, intensifying competition for space between people and wildlife in mixed-use systems. Crucially, whether resulting conflict translates into sustained coexistence or entrenched antagonism depends less on the conflict itself than on the legitimacy of the governance arrangements managing it.

Decades of experience with community-based natural resource management in Zimbabwe demonstrate that inequitable benefit distribution, declining external funding and limited community participation steadily erode the institutional trust on which tolerance for wildlife depends. Emerging qualitative research further shows that communities and protected area authorities often hold divergent conceptions of a fair and legitimate relationship with wildlife, with direct consequences for how conflict is perceived and addressed. Drawing on operational experience within Zimbabwe's wildlife sector alongside this evidence base, this presentation traces a single argument across three interlocking layers: conflict as a visible symptom, landuse change as a structural driver and governance legitimacy as the decisive variable shaping outcomes. It concludes with practical recommendations for strengthening institutional trust and equitable benefit-sharing as the foundation for sustainable coexistence in human-dominated and mixed-use wildlife systems.

**F17****In defence of carrying capacity: Clarifying concepts for modern wildlife management****Peter S. Goodman¹**¹ *Independent, eMkhuze, South Africa*Presenter: Peter S. Goodman; pgoodman@conservation-solutions.org

Carrying capacity, a foundational concept in ecology and wildlife management, has recently come under public scrutiny, criticised as outdated or merely an agricultural construct. This presentation briefly traces the origins of the carrying capacity concept and then develops a typology that has proven useful over the past 45 years for managing wildlife in both extensive open systems and small closed reserves. Carrying capacity rests on two basic ecological truths: no population in a bounded environment can grow indefinitely, and all populations are ultimately limited by space, resources, or ecological interactions. Caughley's concepts of Ecological and Economic Carrying Capacity are revisited and then expanded to include Predator-Mediated Carrying Capacity and Conservation Carrying Capacity. Selecting an appropriate carrying capacity concept requires alignment with the biology and ecology of the herbivore concerned; in multi-species systems, several concepts may need to be applied simultaneously within the same landscape. The expanded typology provides managers with a structured tool for rationalising and communicating their management choices, while recognising that each concept reflects a preferred management outcome. The presentation concludes with a decision aid designed to guide managers in selecting an appropriate carrying capacity model and understanding the implications of that choice for monitoring and management.

**F18****Seasonal variation in herbivore density relative to floodplain distance in the Okavango Delta****Sylvester Samuel¹, Emily Bennitt¹ and Richard Fynn¹***¹University of Botswana (ORI), Maun, Botswana*Presenter: Sylvester Samuel; 201601988@ub.ac.bw

This study examines seasonal variation in large herbivore density relative to distance from floodplains in the Okavango Delta, Botswana, using strip transect surveys conducted from October 2024 to April 2025 across eastern and western study sites. Generalized linear mixed models (GLMMs) with Tweedie distribution revealed that herbivore density strongly declined with increasing distance from floodplains during the dry season, with peak densities near floodplain and riparian zones. This pattern reflects dependence on permanent surface water and persistent green forage in floodplains as dry-season refugia, consistent with resource limitations and optimal foraging principles. In the rainy season, densities shifted, peaking at intermediate distances (5–25 km) and decreasing toward floodplains and distant transects (>30 km), indicating reduced reliance on floodplains when widespread rainfall supports forage and water across the landscape. Floodplain grasses, while vital for dry-season survival, offer lower nutritional quality during wet periods compared to woodland grasslands. Site-specific differences emerged due to anthropogenic factors: the western site, bisected by a veterinary fence plus roads and settlements, showed pronounced rainy-season density increases only at intermediate transects, with minimal use of distant areas, highlighting habitat fragmentation and barriers to movement. These findings underscore floodplains' role as key resource gradients shaping herbivore distribution, particularly in dry seasons, while illustrating how landscape fragmentation and human disturbance alter seasonal patterns and habitat accessibility in semi-arid savanna-wetland systems.

**F19****The influence of an apex predator, *Panthera leo*, on the occupancy of mesopredators****Tyson Williams¹ and Dan Parker¹**

¹ UMP-Oppenheimer Chair in Biodiversity Conservation, School of Biology and Environmental Sciences,
University of Mpumalanga, Mbombela, South Africa

Presenter: Tyson Williams; 250662388@ump.ac.za

Mesopredators experience top-down pressure from larger predators, which may lead to behavioural changes such as temporal and spatial avoidance. Mesopredator release theory states that the presence of an apex predator will result in the suppression of larger mesopredators and the release of smaller mesopredators. This situation will be inverted when the apex predator is absent. This suppression/release model has primarily been tested in simple predator guild. We investigated spatial and temporal occupancy of the mammalian predator guild in areas with ($n = 2$) and without ($n = 2$) lions (*Panthera leo*). We predicted that, if mesopredator release theory is correct, mesopredator species will display different spatial and temporal occupancy in the areas with or without lions. There will also be less overlap in spatial or temporal occupancy between similarly sized species. We used a single-season camera-trapping survey, conducted concurrently at our sites in Limpopo province, South Africa. Spatial and temporal activity patterns were analysed to determine overlap between mesopredator species within each reserve, and between reserves. Our results indicate that smaller mesopredators display spatial or temporal avoidance of larger predators. Mesopredators also spatially or temporally avoid similarly sized species. Behavioural responses are dependent on site-specific factors, not only the presence or absence of lions.

**F20****Bridging the gap: wildlife movement through a newly opened corridor traversing a major national highway in the Eastern Cape, South Africa****Nirvan Goreeba¹, Wesley Gush², and Nokubonga Mgqatsa¹**¹ Department of Zoology and Entomology, Rhodes University, Makhanda, South Africa² Department of Zoology and Entomology, University of Pretoria, South AfricaPresenter: Nirvan Goreeba; nirvan1408@gmail.com

Global land-use change, driven by agricultural conversion, has led to widespread habitat fragmentation and biodiversity loss. In the Eastern Cape, indigenous wildlife was historically displaced by livestock farming in the early 19th Century. Recent shifts toward private game reserves and ecotourism have supported the reintroduction of many of these species, but wildlife populations remain isolated by linear infrastructure such as roads and fences. In August 2024, Amakhala Game Reserve removed key sections of fencing to establish the Bushman's River Wildlife Corridor (BRWC), an underpass beneath a major national highway (N2) joining two previously isolated sections of the reserve. We monitored wildlife movement through the BRWC using camera traps and GPS collar data in the first year following fence removal. As predicted, several species of large- and medium-sized mammals began utilising the BRWC within days of opening, including high profile species such as African elephant (*Loxodonta africana*), lion (*Panthera leo*), and brown hyena (*Parahyaena brunnea*). By contrast, other species took longer (e.g. giraffe *Giraffa giraffa*) or did not move through at all within the first year (e.g. Cape buffalo *Syncerus caffer*). Collar data revealed significant home and core range expansions for lion, elephant and cheetah (*Acinonyx jubatus*), but with variation in the timing and specific space use of the newly accessible area. These results provide a critical precedent for mitigating fragmentation by major road networks in fenced systems, offering scalable insights for ecological connectivity in a region identified for conservation and biodiversity economy development.



F21

Spatial distribution and demographic variation of Chacma baboon (*Papio ursinus*) in Baviaanskloof, South Africa**Elihle Mankuntsu¹, Maya Beukes², Travis Perry³, and Nokubonga Mgqatsa¹**¹ Department of Zoology and Entomology, Rhodes University, Makhanda 6139, South Africa² Audiovisual Biodiversity Research, Terrestrial Zoology, Senckenberg Research Institute and Nature Museum, D-60325 Frankfurt am Main, Germany³ Department of Biology, Furman University, Greenville, SC 29613, USAPresenter: Elihle Mankuntsu; elihlemankuntsu@gmail.com

Chacma baboons (*Papio ursinus*) utilize a wide range of habitats across southern Africa. However, their specific use of habitats in ecologically diverse areas is often poorly understood. In this study, we investigated the spatial distribution and demographic variation of baboons across five landscape types (fynbos, savanna, thicket, forest, and agricultural land) within the Baviaanskloof World Heritage Site, Eastern Cape. Specifically, we aimed to a) describe the spatial distribution patterns and b) assess demographic variation across landscape types. We hypothesized that baboon spatial distribution, as well as age and sex ratios, would vary across landscape types, with adult females, juveniles, and infants preferentially using forested areas more, and other demographic groups more frequently utilising agricultural land. Thirty camera traps were deployed in a stratified random layout over a two-year period (February 2020 to April 2022). Our results show that baboons were more frequently detected in agricultural land and forest habitats. Adult females, juveniles, and infants were more strongly associated with forest habitat, while adult males and sub-adults (both males and females) were more frequently recorded in agricultural land. These findings suggest a functional partitioning of habitat use, with agricultural lands used for foraging and savanna and forest, particularly near water sources, serving as refuges and roosting sites. This spatial pattern is likely to contribute to higher baboon abundance in these areas and may exacerbate human-wildlife conflict in agricultural landscapes.

**F22****Beyond numbers: Setting wildlife management and conservation goals under climate change****Emma Wright¹ and Nicola van Wilgen-Bredenkamp^{1,2}**¹*South African National Parks, Cape Town, South Africa*²*Centre for Invasion Biology, Stellenbosch University, Stellenbosch, South Africa*Presenter: Emma Wright; emma.wright@sanparks.org

Protected area and wildlife conservation has historically centred on maintaining 'natural' ecological processes, conditions and associated population sizes, within the confines of historically observed ecological baselines. Management goals are set against these baselines with interventions aimed at reducing the stressors that hinder their achievement. However, a challenge arises when a stressor may result in historical baselines becoming permanently unachievable. Climate change is among the few drivers of environmental change capable of preventing ecosystems from returning to their historical condition, even when all other pressures have been mitigated. Therefore, there is an increasing and urgent need to incorporate projected climate change impacts into the goal-setting processes of wildlife management and conservation. However, complexity and uncertainty in future projections can overwhelm practitioners, contributing to inaction. In response to this, South African National Parks, in collaboration with the United States National Park Service, has integrated Climate Change Scenario Planning and the Resist-Accept-Direct (RAD) Framework into its management planning processes. This approach uses supporting evidence and climate projections to construct divergent, plausible future scenarios within which vulnerabilities are examined, and existing strategies are stress-tested. Through facilitated workshops, managers and scientists collaboratively identify where current goals and actions may no longer be viable and develop targeted adaptation options. Drawing on examples from several National Parks, we discuss potential implications from this approach for wildlife management (e.g. Resisting change through resource provision vs Directing change with alternate fencing approaches), and the broader implications for conservation management goal setting in an era of rapid change.



F23

The effects of land use on multi-trophic vertebrate community structures in South Africa's Karoo**Jordan Wallace¹, Herve Fritz², Olivier Pays³ and Colleen Seymour⁴**¹*Jordan Wallace, Nelson Mandela University, Cape Town, South Africa*²*Herve Fritz, Nelson Mandela University, Wilderness, South Africa*³*Olivier Pays, University of Angers, Angers, South Africa*⁴*Colleen Seymour, SANBI, Cape Town, South Africa*Presenter: Jordan Wallace; jordanwilliamwallace@gmail.com

Land use and management practices restructure wildlife communities across southern Africa, but whether and how these changes propagate through predator-prey interactions remains poorly understood. This study investigates how management practice shapes mesocarnivore occupancy and abundance across three land use systems: two livestock farming systems differing in both grazing management and jackal control approaches, and a Big Five tourism reserve. Black-backed jackal (*Lupulella mesomelas*) are hypothesised to exert top-down structuring effects on the mesocarnivore community across these systems. Using occupancy modelling and N-mixture approaches from camera-trap and Mostela (small mammal detection tunnel) data, we first test whether management practice constitutes a meaningful ecological driver by examining differences in habitat structure and black-backed jackal density across land uses. We then test whether the occurrence of four mesocarnivore species, namely small-spotted genet (*Genetta genetta*), small-grey mongoose (*Galerella pulverulenta*), yellow mongoose (*Cynictis penicillata*), and striped polecat (*Ictonyx striatus*), is predicted by rodent abundance. We further examine whether habitat quality modulates the strength of this predator-prey relationship, predicting that bottom-up regulation will be strongest where grazing management has maintained structural vegetation cover. Finally, using a multi-species occupancy model, we test whether jackal occupancy suppresses mesocarnivore occurrence independently of shared habitat preferences and rodent availability, and whether this intraguild competitive signal varies across land uses. We predict that livestock farming and Big Five reserves both suppress jackal density but through fundamentally different mechanisms, namely human persecution and large carnivore control respectively, with potentially contrasting consequences for mesocarnivore community structure. If supported, these results will have direct implications for how management decisions in mixed-use landscapes are evaluated beyond simple population metrics, contributing to a broader understanding of conservation outcomes in human-dominated systems.

**F24****Sable antelope habitat selection: machine learning vs. regression modelling****Christopher H. Garrett¹, Kiara Haylock¹, Jason P. Marshal¹, and Francesca Parrini¹**

¹ School of Animal, Plant, and Environmental Sciences, University of the Witwatersrand, Johannesburg, South Africa

Presenter: Christopher Haddon Garrett; haddonchris031@gmail.com

Habitat selection analyses are widely used to inform conservation planning and wildlife management, yet they have traditionally relied on regression-based statistical approaches that may be poorly suited to the non-linear relationships and complex interactions typical of ecological data. These limitations can restrict their usefulness for applied conservation decision-making. The Random Forest machine learning algorithm can provide a flexible alternative with potential to improve predictive performance in complex systems. Using GPS data from sable antelope (*Hippotragus niger*) in Gorongosa National Park, Mozambique, we compared traditional regression models with Random Forests for habitat selection analysis. Model performance was evaluated using multiple standard model performance metrics. While regression models offer relatively straightforward interpretation through coefficient estimates, the Random Forest model consistently showed higher predictive accuracy in identifying habitat selected by sable antelope, likely reflecting its ability to accommodate complex, non-linear relationships among predictors. Improved predictive performance is particularly important in applied conservation contexts, where reliable spatial predictions are needed to inform habitat management and conservation priorities. Our findings suggest that Random Forest models can enhance habitat selection analyses and be a valuable complementary tool to traditional regression approaches in evidence-based conservation and wildlife management.

**F25****Variation in leopard (*Panthera pardus*) density and activity patterns across a multi-use landscape in the Western Cape, South Africa**

Joshua Overmeyer¹, Daniel Parker², Rajan Amin³, Jessica Comley⁴, Anita Wilkinson⁴, Kathryn Williams⁴, Frans Radloff¹

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Presenter: Joshua Overmeyer; joshuatovermeyer@gmail.com

Large carnivores have an important role in maintaining ecosystem functioning but face global declines due to threats such as habitat loss, prey depletion and conflict with humans. In South Africa, leopards persist as one of the last free-roaming apex predators, yet they occupy highly fragmented landscapes. Intriguingly, in the Western Cape it has been found that leopards occur at higher densities in the fragmented agricultural landscape of Piketberg than in the adjacent protected natural habitats of the Cederberg. This study investigates how leopard densities vary across these two landscapes in relation to both anthropogenic (building density and land use) and environmental drivers (elevation, NDVI, prey species richness, vegetation type, terrain ruggedness and precipitation). Existing camera trap data collected by the Cape Leopard Trust (CLT) during 2023/24, using 75 paired camera trap stations, yielded detections of 33 individual leopards in the Cederberg and 45 in the Piketberg areas. Leopard activity centres and densities were determined using a Bayesian Spatially Explicit Capture-Recapture (SCR) model. Leopard densities across both landscapes were mapped at a 500 x 500 m resolution and compared to the covariates, scaled to the same resolution, using general linear models. The most important drivers explaining leopard density variation across both landscapes will be shared and compared at the conference. An understanding of what drives leopard densities across both protected and mixed-use landscapes can greatly enhance conservation success of this iconic species.



F26

Contrasting the impact of vegetation structure on seasonal shifts in prey preferences of lions and cheetahs**Alexandre Nieman^{1,2,3}, Daniel Parker³, Dave Druce¹ and Liaan Minnie²**¹*Welgevonden Game Reserve, Limpopo, South Africa*²*Ecological Research Group, School of Biology and Environmental Sciences, University of Mpumalanga, Mpumalanga, South Africa*³*UMP-Oppenheimer Chair in Biodiversity Conservation, School of Biology and Environmental Sciences, University of Mpumalanga, Mpumalanga, South Africa*Presenter: Alexandre Nieman; alex@welgevonden.org

Prey selection is influenced by multiple factors, including prey availability, hunting strategy, and environmental aspects influencing the latter. This study investigates seasonal shifts in the prey preferences of stalking-and-ambush lions (*Panthera leo*, n=7) and cursorial cheetahs (*Acinonyx jubatus*, n=7), and the impact of visibility on their prey preferences at Welgevonden Game Reserve (WGR). Monthly GPS clusters and driven transect counts were used to estimate prey preferences. Additionally, vegetation structure (i.e., visibility) was measured at 0.4 m and 1.5 m for kill- and resting sites. Cheetah preference changed seasonally, during the dry season, cheetah preferred impala (*Aepyceros melampus*), and during the wet season, they preferred a wider range of prey species, including blesbok (*Damaliscus pygargus phillipsi*), mountain reedbuck (*Redunca fulvorufula*) and Burchell's zebra (*Equus quagga burchellii*). Lion preference did not change seasonally, with blue wildebeest (*Connochaetes taurinus*) and warthog (*Phacochoerus africanus*) making up the majority of lion kills, irrespective of season. Lions show little difference in visibility distance between kill sites and resting sites. However, cheetahs had a significant spatial trade-off; they rested in areas with increased visibility, presumably to reduce competition with dominant lions, while hunting in habitats with less visibility, which likely increases hunting success. This suggests that current management in WGR, aimed at creating more open habitats to facilitate increased grazing capacity, may be reducing the availability of denser habitats used by both cheetahs and lions to increase hunting success.



S4

Predators in the Landscape: Assessing herbivore responses to predator presence in the Eastern Cape**Romesa Muhammad¹, Daniel M. Parker², Michiel P. Veldhuis³ and Nokubonga Mqatsa¹**¹ *Department of Zoology and Entomology, Rhodes University, Makhanda, South Africa*² *UMP-Oppenheimer Chair in Biodiversity Conservation School of Biology and Environmental Sciences, University of Mpumalanga, Nelspruit, South Africa*³ *Institute of Environmental Sciences, Leiden University, Leiden, the Netherlands*Presenter: Romesa Muhammad; romesamuhammad1755@gmail.com

Predators are key drivers of ecosystem structure and function, not only through direct predation but also by indirectly influencing prey behaviour and distribution. In African systems, apex predators like lions (*Panthera leo*) shape herbivore vigilance, foraging, and social organisation. In their absence, herbivores become less vigilant, leading to overgrazing, vegetation shifts, and disrupted ecosystem balance. With the increasing use of predator rewilding and reintroductions in South African reserves, it is critical to understand how herbivore behaviour adjusts to changes in predator presence. This study investigates non-consumptive effects of predators by comparing herbivore responses in reserves and parks with lions to those in reserves and parks without lions. Reserves and parks are selected across the Eastern Cape and paired according to their spatial sizes, dominant vegetation, average rainfall per annum, and preferred lion prey. Aerial and game counts will be used to investigate herbivore group structure by examining adult sex ratios and group sizes. To determine how diet quality differs, faecal samples will be collected and analysed for stable isotopes (C and N), major minerals (Ca, P, Mg, K, and Na). Investigating herbivore responses to predation risk will provide insight into the ecological consequences of predator loss and recovery. The findings will inform conservation managers and policymakers about which species are most affected and why, contributing to more predictive, practical, and ecologically grounded wildlife management strategies.



S5

The potential of using road culverts to facilitate safe wildlife crossings along a provincial road in South Africa**Tanis Short¹, Andreas Hamann¹, Christoffel de Lange² and Marine Servonnat³**¹*Department of Renewable Resources, Faculty of Agriculture, Life, and Environmental Sciences, University of Alberta, Alberta, Canada*²*Lowveld Ecology Lab, Transfrontier Africa NPC, Olifants West Nature Reserve, South Africa*³*Ingwe Research Program, Hoedspruit, South Africa*Presenter: Tanis Short; tshort1@ualberta.ca

Roads pose a substantial threat to wildlife species by creating a barrier to dispersal, fragmenting habitats, and causing wildlife-vehicle collisions. A potential mitigation measure is to encourage wildlife to use pre-existing culverts (i.e., pipes underneath roads designed for water drainage) as safe underpasses. However, culvert usage by wildlife remains poorly understood and likely depends on culvert design, location, and surrounding environmental factors. The R40 provincial road, South Africa, runs through a network of protected and unprotected areas and has experienced high levels of wildlife-vehicle collisions, directly affecting species of high conservation and touristic value. To address this, our study assessed the potential of using culverts to facilitate safe wildlife crossings along the R40 by (1) quantifying current wildlife use of culverts and (2) identifying which characteristics most influence their use. Camera traps were placed at 56 culverts along a 47 km stretch of the R40 near Hoedspruit and we tested how rates of use varied between species and with culvert characteristics. Our findings revealed that species from various taxa frequently used the culverts. Although, rates of use varied widely among taxa, sites, and culvert characteristics. The findings suggest that culverts could be crucial for facilitating safe wildlife crossings, but require careful species-specific consideration. Ultimately, the results from our study will help guide future culvert design, placement, and management, and will contribute to broader efforts to maintain landscape connectivity and wildlife movement across human-modified landscapes.



S6

Balancing resource trade-offs: Drought-driven resource selection by African elephants (*Loxodonta africana*) in Somkhanda Game Reserve**Sorina Venter¹, Timothy Kuiper² and Lucy Chimes³**¹ Nelson Mandela University, George, South Africa² Nelson Mandela University, George, South Africa³ Wildlife ACT Fund Trust, KwaZulu-Natal, South AfricaPresenter: Sorina Venter; s225275953@mandela.ac.za

Current climate projections for South Africa indicate an increasing frequency of multi-season droughts, posing growing challenges for managers of small, fenced reserves where herbivore movement is spatially constrained and management interventions can alter resource availability. This study quantified how drought influenced resource selection in African elephants (*Loxodonta africana*) in Somkhanda Game Reserve (SGR), a community-owned reserve in KwaZulu-Natal.

GPS collar data from an adult female, representing the reserves' only breeding herd, and an adult bull (2022–2025) were analysed using resource selection functions (RSFs). Resource selection was compared across pre-drought (2022–2023), drought (2023–2024), and post-drought (2024–2025) periods, and between wet and dry seasons. We assessed the effects of distance to water, vegetation productivity (NDVI), tree cover, vegetation type, topographic features and distance to anthropogenic features on spatial use. Elephants exhibited shifts in resource selection under drought conditions, with changes in the relative importance of environmental and anthropogenic variables. Patterns suggested context-dependent trade-offs between resource availability and anthropogenic features.

These findings highlight how droughts reshape elephant spatial use and help inform evidence-based management strategies for a small, fenced reserve.



S7

Bats, birds, and landscape context: Predator effects on pest damage in citrus agroecosystems**Thakgatso R. Manamela¹, & Lourens H. Swanepoel^{1,2,3}**¹*University of Venda, Thohoyandou, South Africa.*²*South African Research Chair in Biodiversity Value and Change Interim Chair, University of Venda, Thohoyandou, South Africa.*³*African Institute for Conservation Ecology, Levubu, South Africa*Presenter: Thakgatso Manamela; tetelothakgatso@gmail.com

Agricultural intensification has simplified landscapes and reduced biodiversity, potentially weakening ecological processes such as natural pest regulation. In South African citrus production, pest management relies heavily on chemical control, despite growing interest in biodiversity-based alternatives. Insectivorous vertebrates, particularly bats and birds, may contribute to pest suppression, yet empirical evidence from citrus agroecosystems is limited. This study examined whether insectivorous bats and birds influence insect-mediated crop damage and how landscape context shapes these interactions in citrus orchards. Field experiments were conducted in citrus-producing landscapes within the Vhembe Biosphere Reserve, Limpopo Province. Predator exclusion cages were installed on two randomly selected citrus trees to restrict access by volant vertebrates while allowing insects to enter. Fruit damage was assessed throughout the growing season to quantify pest impacts. Concurrently, nocturnal flying insects were sampled using ultraviolet light traps across orchard interiors, edges, and surrounding semi-natural habitats to characterise insect community composition. Arthropod abundance was highest in riparian and woodland habitats and lowest in orchard interiors, indicating strong spatial effects of habitat context on insect communities. Predator exclusion significantly increased the probability of insect damage in orchard interiors, suggesting that insectivorous vertebrates contribute to pest suppression. Pest damage was generally lower near semi-natural habitats, indicating that landscape context mediates predator–prey interactions. These results show that wildlife can enhance ecological pest regulation in citrus systems, particularly where orchards are embedded in heterogeneous landscapes with semi-natural habitat. Maintaining semi-natural habitats may therefore strengthen predator-mediated pest suppression and support biodiversity-friendly pest management strategies in citrus production.



S8

Temporal activity and overlap between sympatric jackals in a mixed-use landscape at Shangani Holistic Ranch in central Zimbabwe**Nosipho Mlotshwa¹ and Daniel Parker¹**

¹UMP-Oppenheimer Chair in Biodiversity Conservation, School of Biology and Environmental Sciences, Faculty of Agriculture and Natural Sciences, University of Mpumalanga, Mbombela, South Africa

Presenter: Nosipho Mlotshwa; 220368724@ump.ac.za

Understanding how sympatric carnivores coexist in mixed-use landscapes is important for effective wildlife management. Our study examined temporal activity patterns and overlap between black-backed jackals (*Lupulella mesomelas*) and side-striped jackals (*Lupulella adusta*) using camera trap data collected during the wet and dry seasons of 2017 and 2018 at Shangani Holistic Ranch, Zimbabwe. Both jackal species showed mainly nocturnal activity across the seasons. However, temporal overlap differed between seasons, with moderate overlap during the dry season ($\Delta = 0.59\text{--}0.63$) and much lower overlap in the wet season ($\Delta = 0.32$). The reduced overlap in the wet season suggests greater temporal separation, possibly linked to changes in prey availability and/or reduced competition. Our results indicate that temporal niche separation likely enables these sympatric mesopredators to coexist in a mixed-use landscape.



S9

Lion (*Panthera leo*) and spotted hyena (*Crocuta crocuta*) co-existence in Addo Elephant National Park**Georgia Main¹, Nokubonga Mgqatsa¹, Charlene Bissett², Frans Radloff³ and Dan Parker⁴**¹*Department of Zoology and Entomology, Rhodes University, Makhanda, South Africa*²*Scientific services, South African National Parks, Addo Elephant National Park, Addo, South Africa*³*Department of Conservation and Marine Sciences, Cape Peninsula University of Technology, Cape Town, South Africa*⁴*School of Biology and Environmental Sciences, University of Mpumalanga, Mbombela, South Africa*Presenter: Georgia Main; georgiamain28@gmail.com

Apex predators are keystone species, and their position at the head of the trophic level enables them to regulate both mesopredator and prey populations in various ways. Lions (*Panthera leo*) and spotted hyena (*Crocuta crocuta*) are two apex predators that occur in similar habitats and consume prey of similar size and weight. Competition between these species is generally intense and arises from the need for the same resources. This study investigates the potential spatial partitioning of these species in Addo Elephant National Park, Eastern Cape, South Africa. With the changing densities of lions and the increase of spotted hyena densities in the park, we expect that the movement and spaces used by these species may vary from what has been found previously. We aim to determine what spaces the collared individuals use within the park and how this links to resource acquisition. Global Positioning System data from clusters identified from ten collared individuals will be used to assess spatial use of these predators. We predict that lions and hyenas will have areas of spatial overlap, especially if one species is scavenging from another. Despite these overlaps, we expect to find fine-scale spatial partitioning, with each species preferentially using distinct areas within their shared ranges. Understanding the partitioning patterns of these species will provide further insight into the mechanisms of co-existence between competing apex predators.

**S10****Predator abundance and dietary specialization as drivers of human-otter conflict****Trevor McIntyre***University of Johannesburg, Johannesburg, South Africa*

Presenter: Trevor McIntyre; tmcintyre@uj.ac.za

Human-wildlife conflict is common on trout-stocked fishing establishments in South Africa. Previous research reported elevated population densities of African clawless otters (*Lutra capensis* – previously *Aonyx capensis*) on one such estate (Millstream Farm) in Mpumalanga. Here, *L. capensis* and spotted-necked otters (*Hydrictis maculicollis*) occur sympatrically. Earlier reports illustrated that both otter species prey on trout (*Oncorhynchus mykiss*) here, although crabs mostly remained the dominant prey item. Millstream trout stocking and catch records indicate a decline in angler catch rates of trout over the past 20 years, suggesting increasing stock losses. Using data from camera trap surveys, I assessed changes in otter relative abundance between 2018 and 2025 to better understand a potential driver of such losses. Results provided no evidence of increased abundance of either otter species but rather a decrease in their local relative abundance. Therefore, increased otter numbers are unlikely to be responsible for decreased trout survival. Rather, I hypothesize that increased otter dietary specialization may be a better explanation for the ongoing stock losses. Dietary specialization is documented in sea otters (*Enhydra lutris*) and African clawless otters. A driver of dietary specialization is food shortages, and evidence suggests that crab abundance at Millstream Farm declined during the study period. Therefore, a potential mechanism is that locally high otter numbers suppressed crab populations, causing increased dietary specialization on trout. Whilst other influences (e.g. water conditions, other predators) require more investigation, these results support the need to understand the role of dietary specialization in human-wildlife conflicts involving predatory species.



WEDNESDAY, 2 September 2026

Doing the Work: Practical tools, trade-offs, and implementation realities

K3

Keynote: Unintended consequences of a focus on centralized governance of wildlife conservation in African savanna's

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Wildlife conservation strategy in African savannas has focussed on state-led protected areas (PAs), which provide little benefit to local communities and have insufficient coverage to protect key habitats across broader landscapes. Poor conservation coverage and planning across broad landscapes has promoted undirected land use change, fragmentation of functional landscapes and isolation of PAs. A lack of inclusivity and equity in conservation for local communities has led to their resistance of conservation activities e.g. through poaching or by denying state conservation authorities access to key information flow in local social networks. In most African nations, state-led (centralized) conservation authorities lack the funding, human resources and access to social networks to manage conservation activities (e.g. antipoaching) effectively at the local scale. A growing body of knowledge reveals that local communities empowered with decision-making rights over, and benefits from, natural resources are empowered and incentivized to effectively conserve natural resources and prevent poaching at the local scale because they have sufficient human resources, knowledge of local landscapes and access to local social networks. Another observation is that conservation non-governmental organizations (NGOs), with their access to funding and expertise, have been effective in supporting the state to manage PAs in countries where funding for conservation is limited. A pathway therefore exists to improve the effectiveness of conservation within PAs and to expand conservation coverage beyond PAs through collaborative conservation models between state conservation authorities, conservation NGOs and local communities, supported by polycentric governance networks composed of multiple stakeholders. Polycentric governance networks are also critical for planning land use across broad landscapes in a manner that maintains ecosystem integrity and functionality for wildlife, while also facilitating greater equity and inclusivity in conservation for local communities. This social-ecological systems approach to conservation is expected to improve equity and inclusivity for local communities, as well as the effectiveness of wildlife conservation in African savannas.

**F27****Progress toward an aversive geofencing device for controlling the movement of elephants****Benjamin Allen^{1,2} and Surendranie Cabral de Mel^{3,4}**¹ *Ecosure Pty Ltd, Brisbane, Australia*² *Nelson Mandela University, Port Elizabeth, South Africa*³ *University of New England, Armidale, Australia*⁴ *National Institute of Fundamental Studies, Kandy, Sri Lanka*Presenter: Benjamin Allen; ballen@ecosure.com.au

Aversive Geofencing Devices (AGDs) are commercially used around the world to manage the movement of livestock and pets, but technological constraints limit their immediate application to wildlife management problems. We have now overcome most of these constraints and have developed a satellite-linked (i.e. no towers, base stations or local networks required) AGD collar that provides a series of audio warnings followed by an electric shock as the collared animal approaches and then breaches user-defined virtual fences. This presentation describes the limitations of current approaches to managing human-elephant conflict, the development and status of AGDs, and their potential usefulness for wildlife managers. Pilot experiments with captive Asian elephants in Sri Lanka revealed that elephants modify their movements and display desired behavioural and physiological responses to AGDs positioned at specific locations on the neck. These experiments revealed that AGDs do not cause unnecessary stress to elephants and can be safely used to manage them as intended. This new tool has potential to minimise human-elephant conflict by conditioning problematic elephants to stay in or out of places where conflict may arise, reducing conflict and enhancing elephant conservation. We invite collaboration to further refine the development of AGDs and demonstrate their utility in real-world applications.

**F28****Beyond numbers: when lion monitoring supports conservation decisions****Jan A. Venter¹***¹Department of Conservation Management, Nelson Mandela University, George Campus, George, South Africa*

Presenter: Jan A Venter; JanVenter@mandela.ac.za

Conservation management requires decisions to be made under uncertainty, yet guidance is limited on how population estimates and their uncertainty should be interpreted relative to specific management actions. Spatially explicit capture–recapture (SECR) models are increasingly used to monitor African lions, but their outputs are often treated as decision inputs without explicit evaluation of whether they are sufficient to support different conservation decisions. Using SECR surveys from three study systems spanning fenced, semi-closed, and open landscapes, I examine what is learned when SECR outputs are operationalised for real management contexts. I evaluated estimates of abundance, density, movement, detection, and sex structure against four hypothetical decision contexts representing common lion management challenges: population status assessment, sustainable removals, conservation intervention escalation, and population regulation. Across systems, SECR produced internally consistent estimates, but decision readiness varied strongly with encounter structure and resulting uncertainty. Low-uncertainty estimates supported inference across multiple decision contexts, whereas higher uncertainty constrained interpretation to coarse-scale assessment or precautionary use. By framing SECR outputs within a decision-readiness perspective grounded in decision science, this study provides practical guidance for interpreting SECR results relative to management needs, highlighting both the potential and the limits of SECR for evidence-based lion conservation.

**F29****Monitoring Lepidoptera in real-world conditions**

**Marijke Koopmans¹, Michele Walters¹, Juan Scheun¹,
and Michael Somers²**

¹ *BioPulse Research Group, Tshwane University of Technology, Pretoria, South Africa*

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Presenter: Marijke Koopmans; Marijkek0202@gmail.com

Effective biodiversity monitoring depends not only on sound ecological validation, but also on whether methods can be implemented reliably under real-world field conditions. This presentation reflects on the use of light traps for Lepidoptera, specifically moth monitoring as a practical case study of the challenges involved in translating monitoring concepts into operational practice.

Light trapping is widely regarded as an effective approach for sampling moth assemblages, with strong potential for long-term monitoring. However, in this study, implementation at the intended scale was constrained by repeated equipment failure and environmental conditions. Battery limitations, declining light output, severe rain/moisture exposure, extreme cold temperatures, and equipment fragility reduced trap reliability and consistency, particularly during extended field deployment periods. Considerable trial and error were therefore required to test, modify, and refine the method under resource and logistical constraints.

Although these challenges prevented broader application in the project, they generated important practical insights into the limitations of applying technically demanding sampling methods in complex environments. The lessons learned informed the subsequent use of light traps in a smaller-scale trap project, where the approach proved more feasible and successful, suggesting that, resources and operational realities permitting, light trapping for long-term monitoring purposes could provide valuable insights into Lepidoptera community dynamics, beyond mere presence/absence surveys.

**F30****Challenges facing the conservation of African wild dogs in a managed metapopulation framework****Eugene Greyling¹ and C. du Plessis¹**¹*Endangered Wildlife Trust, Midrand, South Africa*Presenter: Eugene Greyling; EugeneG@ewt.org

African wild dogs (*Lycaon pictus*) influence human livelihoods across shared landscapes, a relationship that continues to drive key conservation challenges and contributes to their Endangered status. Although competition with humans for resources, infectious disease, and snaring are among the well-documented anthropogenic threats to the species, habitat fragmentation and the loss of secure space have had the most significant impact. The Endangered Wildlife Trust's Wild Dog Range Expansion Project applies an evidence-based metapopulation management approach designed to replicate natural ecological processes that are otherwise constrained in human-dominated landscapes, thereby facilitating the species' persistence. Despite notable success, evidenced by a regional increase in safe space (1998–2025; 1,516–15,911 km²), population numbers (range: 37–405; >12 months old), and preservation of genetic integrity, this approach remains hindered by several key challenges that require innovative solutions. Here, we highlight ongoing challenges and broadly discuss some proposed solutions to maintain existing populations and successfully restore extirpated populations across the species' range. Enabling African wild dogs not only to persist but to thrive (i.e., improving their conservation status) requires a multifaceted, socio-ecological approach that prioritises long-term species welfare.



F31

Can camera trapping effectively monitor black rhinoceros (*Diceros bicornis minor*)? Insights from the southern Kruger National Park**Matthew Altenkirk^{1,2}, Nokubonga Mqgatsa¹, Daniel M. Parker³ and Katherine Forssman²**¹ Department of Zoology and Entomology, Rhodes University, Makhanda, South Africa² School of Biology and Environmental Sciences, University of Mpumalanga, Mbombela, South Africa³ UMP-Oppenheimer Chair in Biodiversity Conservation, University of Mpumalanga, Mbombela, South AfricaPresenter Matthew Altenkirk maltenkirk@hotmail.com

Effective monitoring of low-density, elusive species remains a central challenge in conservation. The black rhinoceros (*Diceros bicornis minor*) in the Kruger National Park (KNP) is particularly difficult to monitor due to low population densities, wide-ranging movements, and imperfect detectability. Camera trapping is increasingly used as a non-invasive monitoring tool, yet its effectiveness for black rhinoceros remains uncertain. This study evaluated the utility of camera trapping for detecting black rhinoceros, quantifying spatial patterns of site use, describing temporal activity patterns, and assessing whether photographic data could support individual identification for population monitoring. A targeted camera-trap survey was conducted across 21 sites over an eight-month period (2023, 2024). Detection data were analysed to quantify site-level variation in detections, assess spatial patterns in site use, and derive diel activity patterns. Photographic records were further examined to evaluate the feasibility of individual identification. Camera traps successfully detected black rhinoceros across multiple sites and revealed predominantly nocturnal and crepuscular activity patterns. However, detection rates varied spatially, indicating heterogeneity in site use across the landscape. Moreover, individual identification from images was unreliable due to inconsistent image quality, camera placement constraints, and limited distinguishing morphological features, preventing robust application of mark-recapture approaches. These findings demonstrate that while camera trapping is effective for detecting black rhinoceros and describing spatial and temporal patterns of activity, it is currently unsuitable as a standalone method for population estimation. Camera traps are best applied as a complementary monitoring tool within integrated frameworks that combine multiple data sources to improve conservation decision-making.



F32

Spatially explicit capture-recapture performance under time- and resource-constrained sampling**Renske van der Hoek¹ and Christoffel de Lange²**¹ *Wildlife Ecology and Conservation, Wageningen University and Research, Wageningen, Netherlands*² *Lowveld Ecology Lab, Transfrontier Africa NPC, Olifants West Nature Reserve, South Africa*Presenter: Christoffel de Lange; ecology@transfrontierafrica.org

Reliable animal density estimates are crucial for informed ecological management and research. To generate these estimates, spatially explicit capture–recapture (SECR) methods are increasingly being used, as they address several shortcomings associated with other capture-recapture methods. However, the sampling designs recommended for SECR are often impractical when managers and researchers have limited time and resources. Thus, to guide the application of SECR in such cases, our study compared how SECR models perform under unconstrained (not limited by time and resources) and constrained sampling (limited by time and resources). This was achieved by deploying a camera trap grid meeting all SECR recommendations (i.e., an unconstrained sampling design) to estimate spotted hyena *Crocuta crocuta* density in Olifants West Nature Reserve, South Africa. Subsequently, data from this grid was subsampled to simulate sampling designs with fewer cameras and shorter sampling durations (i.e., constrained sampling designs). We then compared key model performance metrics (e.g., measures of accuracy and precision) derived from models when using the unconstrained and constrained data for density estimation. Our results revealed that SECR performance declined under constrained sampling, with steeper declines when camera trap numbers decreased compared to when sampling days decreased. However, we also found that this performance loss was minimised when the cameras were strategically spread across the study area. Ultimately, our study highlights the challenges of implementing SECR methods, illustrates how time and resource constraints can affect SECR results, and offers guidance on improving constrained sampling designs to yield usable density estimates.

**F33****From detection to counting; comparing aerial counting methods using remote sensed imagery and machine learning in the savanna biome****Paul Allin^{1,2}, Andrew Davies³, Frans Radloff⁴ and Alison Leslie¹**¹ *Department of Conservation Ecology and Entomology, Stellenbosch University, Matieland, South Africa*² *Lowveld Ecology Lab, Olifants West Nature Reserve, Hoedspruit, South Africa*³ *Department of Organismic and Evolutionary Biology, Harvard University, Cambridge, MA, 02138, USA*⁴ *Department of Conservation and Marine Sciences, Faculty of Applied Sciences, Cape Peninsula University of Technology, Cape Town, South Africa*Presenter: Paul Allin, research@transfrontierafrica.org

Reliable animal censuses are key to making informed conservation decisions. The methods for censuses have remained largely unchanged since the 1970's and are not only time consuming and costly, but also fraught with error. Recently machine learning algorithms have started to outperform humans in the detection and counting of objects in imagery. However, although much research is being conducted using advanced machine learning to detect and count wildlife, very few explore the sources of error when using remote sensed data and how that can impact the overall count. For this study we conducted a comparative analysis between counts done by helicopter and remote sensed imagery obtained using a drone, covering 23 breeding camps with known populations of seven different ungulate species across three canopy cover densities.

All camps were surveyed three times, using both methods, within a 5-day period at the end of the dry season. We developed a machine learning algorithm using manually annotated imagery to detect the 7 species. This algorithm was used to detect the animals in both orthomosaics and individual images. To avoid double counting we created a novel algorithm to locate each detection and remove individual animals on multiple overlapping images. The results of the novel algorithm were compared to the helicopter and manual annotation as well as the known population. This significantly improved the automated count using remote sensed imagery when compared to orthomosaics. Our results shed light on errors that arise from different counting methods and give valuable context to managers and ecologist.

**F34****Niche overlap or competitive exclusion? Investigating bushbuck and nyala co-occurrence at Pullen Nature Reserve****Phiwase Khoza¹, Jason Marshal² and Francesca Parrini³**¹*University of the Witwatersrand, Johannesburg, South Africa*²*University of the Witwatersrand, Johannesburg, South Africa*³*University of the Witwatersrand, Johannesburg, South Africa*Presenter: Phiwase Khoza; phiwasek25@gmail.com

Interspecific competition between ecologically similar congeners can drive niche partitioning, yet the mechanisms facilitating coexistence between nyala (*Tragelaphus angasii*) and bushbuck (*Tragelaphus scriptus*), two closely related species that broadly overlap in habitat use, remain poorly understood. This is particularly in areas where nyala have expanded into established bushbuck range. This study aimed to assess whether nyala and bushbuck partition their ecological niche spatially or temporally, or whether evidence of competitive displacement is detectable over time. We used camera trap data collected across multiple survey years (2013-2026) to investigate the spatial and temporal relationships between these two species at Pullen Nature Reserve, in the Mpumalanga lowveld. We did ground-level vegetation surveys at each camera trap site to characterise habitat use by each species. Occupancy models incorporating slope, elevation and NDVI as covariates were used to assess how environmental variables influence the occurrence of these species. Camera trap timestamps were used to characterise timing of occurrence by each species. Preliminary findings suggest broad overlap in habitat use between the two species, but some degree of temporal separation, with bushbuck displaying predominantly crepuscular activity and nyala being primarily active during the day. These findings will highlight the importance of long-term monitoring in the detection of competitive dynamics between sympatric species, with implications for the management of small reserves where species introductions may alter established community structure.

**F35****Comparing satellite tracking and aerial surveys to assess water-driven distribution of large herbivores in a semi-arid savanna****Petrus J. (Hanno) Kilian^{1,2}, Francois Deacon², Paul J. Malan² and Gert N. (Nico) Smith²**¹*Khamab Kalahari Reserve, Bray, Northwest Province, South Africa*²*Department of Animal Science, University of the Free State, Bloemfontein, South Africa*Presenter: Hanno Kilian; e-mail ecologist@khamab.co.za

Water availability is a primary determinant of herbivore distribution in semi-arid savanna ecosystems, yet the degree to which different monitoring approaches capture water-dependent spatial patterns remains insufficiently resolved. This study evaluates the relationship between waterhole distribution and herbivore occurrence for gemsbok (*Oryx gazella*), blue wildebeest (*Connochaetes taurinus*), and plains zebra (*Equus quagga*) in the eastern Kalahari, using two independent datasets collected over the same period.

The first dataset comprises satellite tracking locations, providing high-resolution information on movement and space use for selected individuals. The second dataset consists of species locations recorded during aerial game counts, representing population-level spatial distributions observed during surveys. For each species, distances from recorded locations to the nearest waterhole were calculated, and the resulting distributions were compared to identify distance-to-water ranges associated with occurrence.

Comparative analyses assessed whether patterns derived from satellite tracking reflect those observed at the population level, and whether both approaches detect similar water-related spatial responses. While satellite tracking offers high temporal resolution, it is limited by smaller sample sizes; aerial counts provide broader spatial coverage but represent temporal snapshots.

Results from aerial surveys were broadly similar to satellite-derived patterns, although the level of similarity varied among species. Plains zebra showed the strongest similarity, with both methods indicating increased use of areas closer to water. Blue wildebeest showed partial similarity, with aerial data suggesting stronger use of areas near water than indicated by tracking data. In contrast, gemsbok showed the greatest difference, with tracking data indicating clearer use of intermediate to more distant areas from water. These findings indicate general consistency between methods, alongside species-specific differences in water-related space use.

**F36****Assessing DNA integrity in wildlife forensic samples: The impact of sample age, processing techniques & environmental factors on species identification****Rivaldo Mockson¹, Paul Grobler¹, Karen Ehlers¹ and Gerda Marx¹**¹*University of The Free State, Bloemfontein, South Africa*

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Presenter: Rivaldo Mockson, 2018248217@ufs4life.ac.za

Wildlife DNA forensics can play a crucial role in assisting with law enforcement for cases involving endangered wildlife species. However, the rate of DNA degradation under various conditions and its impact on species identification remains poorly understood for many species. This study examined; (i) DNA degradation of blesbok (*Damaliscus pygargus phillipsi*) blood samples collected from multiple substrates over time and (ii) the effects of processing techniques of biltong (single species blesbok) and dry sausage (mixture species with blesbok). For (i), blood was collected from a fresh carcass and deposited on materials typically encountered at wildlife crime scenes; metal, rubber, cotton, soil, grass, and wood. Sample storage conditions: indoors, outdoor semi-covered, and outdoor fully exposed. Sampling occurred daily for the first week, every second day for two weeks, and weekly until day 102. DNA was extracted and the COI region was targeted for species identification. Initial results revealed that all substrates, except cotton, yielded sequences suitable for species identification on days 1 through 7. However, on day 51, only indoor samples produced amplifiable DNA. Microsatellite analysis of blood samples demonstrated allele loss over time. For (ii), processed tissue samples were left to dry, and by using DNA barcoding, blesbok was identified from biltong after a 7-month drying period. Dry sausage proved challenging, even with quintuplicate sampling DNA barcoding consistently identified only cattle (*Bos taurus*), suggesting a high proportion of cattle in the product and preferential amplification of dominant templates. Blesbok DNA presence could not be confirmed due to qPCR probe failure.

**F37****Development of Zambia's first wetland information system - the Kafue Flats Wetlands Information System (KFWIS)****Kelvin Steven Floyd¹, Douglas Munenga¹ and Hickey Kalolekesha¹***¹International Crane Foundation, Lusaka, Zambia*Presenter: Kelvin Steven Floyd floyds@savingcranes.org

Zambia's Kafue Flats, approximately 6,500 km², is a Key Biodiversity Area, a Ramsar Site, and the country's only UNESCO Man and Biosphere Reserve. Bounded by two National Parks: Blue Lagoon and Lochinvar, and the Game Management Area, it is home to an endemic antelope, Kafue Lechwe (*Kobus leche kafuensis*), over 460 avian species, and includes ~30% of the global Vulnerable Wattled Crane (*Bugeranus carunculatus*) population. The Flats also provide critical ecosystem services by contributing about 50% of Zambia's hydroelectricity, 90% of the nation's sugar, 7% of the country's fisheries, 44% of the water used in Lusaka and over 20% of the national beef. Despite its ecological and economic importance, the Kafue Flats doesn't have a centralised database that is easily accessible to park managers, researchers, and policymakers. In response, the International Crane Foundation developed the Kafue Flats Wetland Information System (KFWIS), the first wetlands database in Zambia. The system serves as a vital centralised platform that provides accessible and reliable biodiversity data supporting effective strategies, evidence-based conservation, ecological monitoring, adaptive management and data-driven informed decision-making. By integrating datasets across taxa, the KFWIS improves the capacity to track population trends, species diversity, and statuses, and identify conservation priorities. Additionally, it strengthens Zambia's ability to meet international reporting obligations under the Ramsar Convention, the Convention on Biological Diversity, and other conventions. The KFWIS provides a model in wetland biodiversity monitoring and management and a case study of how data-driven systems can address biodiversity information gaps in Zambia's protected areas and Ramsar sites.



F38

Tools within a system: What really drives anti-poaching success at Hluhluwe-iMfolozi Park?**Timothy Kuiper¹, Jo Shaw², Vuyiswa Radebe³, Cedric Coetzee³**¹*Nelson Mandela University*²*Save the Rhino International*³*Ezemvelo KZN Wildlife**Presenter: Timothy Kuiper; timothykuiper@gmail.com*

Anti-poaching is usually framed as a question of tools: which intervention works best? Ten years of investment at Hluhluwe-iMfolozi Park (HiP), a globally significant rhino stronghold, tells a different story. We draw on 25 interviews and extensive poaching and operational data, applying process tracing and contribution analysis to attribute changes in poaching to specific interventions. Dehorning is the dominant driver of HiP's recent decline, acting proactively on poacher incentives, robust to corruption, and less dependent on long causal chains than other interventions. Polygraph testing and a reconstituted intelligence and investigations function are credible early disruptors of the insider information and external coordination on which syndicates depend. The reactive response chain of cameras, K9, helicopter, and operations control centre delivers arrests and disrupted incursions, but is constrained by a deterrence gap and the fragility of long chains in which any single failure collapses the whole. The decisive finding lies elsewhere. Interventions are tools within a system, and their ceiling is set not by the tools themselves but by leadership at multiple levels, staff welfare, organisational trust, and internal integrity. The same camera, dog, or polygraph performs differently depending on the people and conditions around it. Where field staff feel valued, equipped, and led, intelligence flows and tools deliver; where they do not, even the best-funded interventions underperform. Sustained NGO partnership has been indispensable but needs formalising into core institutional capacity. Dehorning has bought HiP a breathing space; whether the gains hold depends on the harder, slower work of strengthening the system that holds the tools.

**S11****A cost-effective lens on complex carnivore habitats****Holly Atkinson^{1,2}, Mark Eisler¹, Gabriele Cozzi², David Hofmann^{2,3} and Nicola Rooney¹**¹*Bristol Veterinary School, University of Bristol, Bristol BS40 5DU, UK*²*Botswana Predator Conservation Program, Wild Entrust, Private Bag 13, Maun, Botswana*³*University of Zurich, Winterthurerstrasse 190, CH - 8057 Zurich*Presenter: Holly Atkinson; holly.atkinson@bristol.ac.uk

Monitoring of wildlife species is rarely combined with detailed habitat monitoring, despite the importance of habitat information in understanding ecological processes. Remote sensing approaches can provide high-resolution habitat data, but often involve unvalidated desk-based classification models, rather than genuine field-based ground truthing. Combining monitoring methods helps to address time pressures and costs experienced by organisations tasked with wildlife monitoring. Botswana Predator Conservation (BPC) has been continuously monitoring large carnivores within the Okavango Delta since 1989. This fieldwork presents the opportunity to gather large-scale, contemporaneous habitat information, which is currently collected only sporadically during carnivore sightings. The aims of this project are to: (1) combine systematic habitat data collection with ongoing carnivore monitoring to opportunistically capture seasonal and yearly habitat changes and flooding extent for the eastern Delta; (2) use habitat data as ground-truth validation to create accurate, high-resolution, remote-sensed habitat maps for use in carnivore resource selection and connectivity assessments.

Using 360° GoPro technology, we are capturing seasonal habitat composition and structure, and flood extent at regular intervals along sand roads during carnivore tracking sessions. This geo-tagged habitat dataset currently totals ~31,500 images and covers an area of ~3,030 km² in the eastern Delta, at virtually no extra cost to BPC. This data will be used to create habitat layers crucial for understanding carnivore movement and resource selection. The data collection and processing methodology will be optimised and standardised in a user-friendly protocol to enable reproducibility and encourage its future use at BPC, and across comparable long-term monitoring projects.

**S12****Cheetah densities in Kruger National Park: group size matters****Jeanette Fouché¹, James E. T. McKaughan^{2,3}, Brian K. Reily⁴ and Kelly A. Marnewick¹**¹*Department of Nature Conservation, Tshwane University of Technology, Pretoria, South Africa*²*Department of Anthropology, Durham University, Durham, United Kingdom*³*Conservation Ecology Group, Department of Biosciences, Durham University, Durham, United Kingdom*⁴*Department of Genetics, Faculty of Natural and Agricultural Sciences, University of Free State, Bloemfontein, South Africa*

Presenter: Jeanette Fouché; gtfouche@gmail.com

Cheetahs (*Acinonyx jubatus*) are classified as Vulnerable and depend on large, well-managed conservation landscapes to maintain viable populations and prevent further declines. Reliable population estimates are therefore critical for effective conservation planning and long-term monitoring. In South Africa's Kruger National Park (KNP), cheetahs are surveyed every three to four years through tourist photographic surveys, a citizen science approach that enables spatial and temporal data collection at low cost. Manual identification of individuals from large photographic datasets has been time-consuming, prone to human error, and increasingly impractical as data volumes expand. This study applied ArgusWild AI to assist with data curation and identification of cheetahs from images collected during the 2021/22 KNP Cheetah Photographic Census (CPC), followed by population density estimation using spatially explicit capture–recapture (SECR) models. To address violations of model assumptions caused by social behaviour and heterogeneous space use, analyses were stratified by social group, including single males, single females, male coalitions, and females with offspring. A total of 114 individuals were identified from 151 sightings. Stratified SECR analyses, based on all identified individuals, produced a density estimate of 0.58 cheetahs per 100 km², compared to 0.30 cheetahs per 100 km² when all individuals were pooled, demonstrating improved model fit and reduced bias.

**S13****Water quality and waterhole use by animals in semi-arid reserve, central Free State****Desiree M. Dibakwane¹, Beanelri B. Janecke¹ and Tascha Vos²**¹*Department of Animal Science, University of the Free State, Bloemfontein*²*Centre for Environmental Management, University of the Free State*Presenter: Desiree Dibakwane; desireemdibakwane@gmail.com

Water availability is a key ecological factor influencing wildlife distribution, movement, and behaviour. In fenced reserves, artificial and natural waterholes serve as critical resources especially during dry periods, yet animals do not use all water sources equally. This study monitored three waterholes at Franklin Game Reserve from May to August 2025. Trail cameras recorded animal species visitation and the number of visitations that lead to drinking. Water parameters were measured and water sampled to assess physical and chemical properties, algal biomass, and algal composition. Blue wildebeest, blesbok and ostrich primarily visited open waterholes on the plains, with 70–91% of visits resulting in drinking despite variable water clarity and water quality. Fallow deer, nyala, porcupine and yellow mongoose used shaded or low-productivity waterholes on hill slopes, showing tolerance to low dissolved oxygen and dense vegetation. Animals did use one waterhole with higher nutrient loads and algal biomass, indicating that openness and predator visibility can possibly, in some cases, override water quality limitations. Overall, water quality at all sites remained sufficient for drinking. This study formed the baseline for another study at Tri-Hunt Game ranch in the central Free State where five different waterholes will be studied for animal visitation and water quality. Preliminary results indicated that species-specific ecological requirements and safety considerations play an important role in waterhole use. Understanding these patterns provides practical guidance for reserve management, emphasizing the need to maintain diverse waterhole types and consistent water availability to support multiple species in semi-arid reserves.

**S14****Hidden in plain sight; A case for proclaiming protected areas****Murray James Keeton¹***¹ Ukuzwana Foundation, Piet Retief, South Africa*Presenter: Murray Keeton; m.keeton@ukuzwana-foundation.org

Ukuzwana-Witbad Nature Reserve located in Mpumalanga province, is a privately managed conservation initiative dedicated to land conservation which began last year. Situated in a transitional eco-tone between highveld grasslands in the north and savanna biomes in the south, the reserve holds expansive open grasslands, seasonal and permanent wetlands, riverine corridors, wooded valleys, and a variety of forests—habitats that support a remarkable diversity of flora and fauna. The three of the four vegetation types on the reserve are classified as Vulnerable, with 60% being Critically Biodiverse Area (irreplaceable).

Biodiversity surveys conducted on the reserve have documented over 275 bird species, of which 26 are of conservation concern. Three confirmed reptile range extensions, underscoring the area's unique ecological positioning. Fish Surveys have found over 20 species of fish with 4 having conservation status and 12 being endemic. The mammalian assemblage is equally rich, with both species of otter occurring on the property, large antelope populations (including over 1000 blesbok), a growing suite of carnivores as well as a very healthy meso-carnivore guild, including 6 species of mongoose, serval, caracal, brown hyena, african wild cat, genet, etc. Tree and woody-plant diversity further add and reflect this habitat complexity, supporting invertebrates, mammals and overall ecosystem function.

These findings demonstrate that Ukuzwana-Witbad Nature Reserve functions as a critical refuge and research node within Mpumalanga's fragmented conservation estate. By integrating ongoing restoration efforts with baseline inventories, the reserve shines as yet another example among many of why proclaiming protected areas is still important.

**S15****Lead toxicosis hampers southern ground-hornbill recovery in South Africa****Lucy Kemp¹, Nthabiseng Monama², Tebogo Baloyi³ and Tracy Basch¹***¹Reintroduction Monitor - Mabula Ground-Hornbill Project, Bela-Bela, South Africa**²Education and Reintroduction Manager – Mabula Ground-Hornbill Project, Bela-Bela, South Africa**³Director – Mabula Ground-Hornbill Project, Bela-Bela, South Africa*Presenter: Tracy Basch, reintro@ground-hornbill.org.za

The Southern ground-hornbill (*Bucorvus leadbeateri*) is regionally Endangered in South Africa and Vulnerable globally. Over the last 20 years, conservation efforts have focused on harvesting redundant second-hatched chicks for reintroduction. These chicks are artificially reared and spend four to five years in mentored groups to learn survival skills before final placement. Modelling suggests 20 contiguous groups are required for sustainable population growth, which is a considerable but not impossible feat. While refined rearing protocols have achieved a 95% fledging success rate, the current survival rate to adulthood of reintroduced stock is 48%. Although this exceeds the 30% success rate observed in wild groups, it remains suboptimal. Analysis indicates that removing the impacts of lead toxicosis would increase the reintroduction success rate to 75%. Lead poisoning affects candidates through both acute mortality and sub-clinical effects, including accidental deaths, breeding difficulties, and the breakdown of essential social structures. To address this, a national education campaign is underway, involving hunting and fishing organisations, conservation NGOs, and government bodies. By incorporating lessons from Europe and the USA, this collaborative effort aims to eliminate lead exposure as a primary driver of reintroduction failure, ensuring the long-term viability of the species.

**S16****Elusive in the Canopy: The Challenges of Monitoring Strepsirrhine Populations in Natural Environments****Juan Scheun¹, Michelle Sauther², Frank Cuozzo³ and Channen Long ¹**

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Monitoring the population dynamics of small, nocturnal primates presents significant challenges in wildlife ecology. Strepsirrhines, such as galagos, are particularly difficult to study due to their cryptic behaviour, arboreal lifestyle, small body size, and rapid movement through dense vegetation. These characteristics limit the effectiveness of conventional monitoring techniques and complicate long-term assessments of population trends in natural environments. While methods such as camera trapping, acoustic monitoring, and visual surveys have been used in nocturnal primate research, their reliability can vary when applied to fast-moving species inhabiting complex forest structures. This study examines the challenges of monitoring strepsirrhine populations through a case study of thick-tailed bushbabies (*Otolemur crassicaudatus*) at the Lajuma Research Centre in the Soutpansberg Mountains of South Africa. As part of an ongoing research program, data on endocrine responses and microbiomes have been collected to better understand how these factors relate to environmental conditions and ecological pressures. However, gathering such data requires the direct capture and temporary restraint of individuals, which introduces additional methodological concerns. Stress responses related to capture may affect endocrine profiles and, consequently, influence the interpretation of physiological indicators of health, stress, or environmental change. Moreover, the difficulty of repeatedly detecting and sampling individuals complicates the establishment of robust long-term monitoring frameworks for these species. This presentation highlights the methodological constraints involved in studying strepsirrhines and discusses their implications for population assessments and conservation research. By reflecting on challenges in the field and integrating physiological and microbiome data, the study aims to enhance monitoring approaches for nocturnal primates and stimulate discussion of effective strategies for studying cryptic arboreal species in natural ecosystems.

**S17****Seasonal space use of female Cape buffalo in the Great Fish River Nature Reserve****Rebecca O'Sullivan¹, David Michael Scantlebury¹ and Craig Tambling²**¹*Queen's University Belfast, Northern Ireland*²*University of Fort Hare, South Africa*Presenter: Rebecca O'Sullivan, rosullivan06@qub.ac.uk

Understanding the drivers of animal space use is critical for effective wildlife management, particularly in environments where resource availability can vary over time. In this study, we investigated seasonal space use of female Cape buffalo (*Syncerus caffer caffer*) within the Great Fish River Nature Reserve (GFRNR), a thicket-dominated protected area in the Eastern Cape of South Africa.

Using GPS collar data collected from adult female buffalo between 2021 and 2025, we estimated home range size across seasons using autocorrelated kernel density estimation. Mean home range size was approximately 32 km², with little variation between seasons. Across individuals, we found no evidence of seasonal expansion or contraction in home range. Instead, variation was more strongly associated with differences between individuals than with seasonal environmental change.

These findings contrast with patterns commonly reported in highly seasonal savanna systems, where rainfall variability often drives shifts in herbivore space use. In GFRNR, relative stability in the availability of some resources may reduce the need for seasonal range adjustment, resulting in consistent space use throughout the year. Ongoing resource selection analyses are being conducted to further investigate how buffalo respond to spatial variation in environmental covariates within thicket landscapes.

These results highlight the importance of local environmental context in shaping movement patterns and provide a practical baseline to inform wildlife management and habitat planning in thicket ecosystems.

**S18****Comparing density estimates and resource selection of Plains Zebra using machine-assisted versus manual identification in photographic surveys****Victoria Selby¹, Jason Marshal² and Fitsum Abadi³***¹University of Witwatersrand, Johannesburg, South Africa**²University of Witwatersrand, Johannesburg, South Africa**³New Mexico State University, New Mexico, United States of America⁴*Presenter: Victoria Selby; 2302943@students.wits.ac.za

Spatial capture recapture has been developing rapidly allowing for more accurate estimation of population abundance and density. At the same time the availability of large datasets that contain an abundance of information are increasing. However, manually processing these datasets is creating a bottleneck. To address this, machine assisted processing platforms are being increasingly used for species detection and individual identification. However, these platforms have only been assessed on camera trap data, and their performance still needs to be assessed on different input data, such as fixed path-search encounter data.

This study aims to quantify the level of error introduced through machine assisted individual identification and whether this error introduces bias on population estimates such as abundance, density and resource selection patterns of Plains Zebra.

Bayesian hierarchical modelling will be used to investigate abundance and density, while resource selection functions will identify habitat characteristics important for Plains zebra. This study will provide insight into the reliability of machine-assisted identification for population and habitat analyses.

**S19****From Asset to Action: Developing a University-Owned Reserve as a Platform for Biodiversity Conservation and Learning****Tumelo Nhlapo¹ and Francesca Parrini¹***¹University of the Witwatersrand, Johannesburg, South Africa*Presenter: Tumelo Nhlapo; Tumeloisnhlapo@gmail.com

University-owned field stations in biodiverse landscapes provide sustained access to ecosystems for teaching, postgraduate training, and long-term ecological monitoring. Pullen Nature Reserve, donated to the University of the Witwatersrand in 1985 and managed by the School of Animal, Plant and Environmental Sciences (APES), is situated within Mpumalanga's Savanna Biome. Following a period of limited use, the reserve is now guided by a strategic five-year development aims to establish it as an active biological field station that integrates research, teaching, and on-the-ground management.

Active veld management by on-site staff is restoring ecological conditions necessary for biodiversity management and repeatable, long-term monitoring. Management interventions focus on veld condition assessment, bush encroachment, invasive alien plant control, and habitat restoration, providing a practical setting to evaluate management decisions and trade-offs typical of savanna systems.

The reserve supports work-integrated learning through student participation in veld condition assessments, game counts, and applied ecological monitoring techniques. Research opportunities span studies of large and small mammals, nocturnal fauna, reptiles, and vegetation, providing a rich platform for advancing savanna ecology and conservation science.

Together, these activities position Pullen Nature Reserve as a field station where the effects of land management practices and restoration interventions can be tracked systematically over time. We present Pullen as a case study demonstrating how academic institutions can make use of their land assets as applied management and research sites, contributing practical insights into adaptive wildlife management while training future practitioners.

**S20****Spatial occurrence and habitat selection of brown hyaenas *Parahyaena brunnea* in Lapalala Wilderness****R.B. Mokomane^{1,2} and Kelly Marnewick¹**¹*Department of Nature Conservation, Tshwane University of Technology, Pretoria, South Africa.*²*Lapalala Wilderness, Vaalwater, Limpopo, South Africa*Presenter: Kelly Marnewick, MarnewickKA@tut.ac.za

The brown hyaena *Parahyaena brunnea*, is Near-Threatened in South Africa, and plays a critical role in maintaining ecosystem health. This study investigates the spatial distribution and species-habitat relationship of brown hyaena within the Lapalala Wilderness Nature Reserve, a 48,000-hectare reserve in the Waterberg Biosphere. The study looks at the distribution and species-habitat relationship before and after the introduction of large predators such as lions *Panthera leo* and spotted hyaenas *Crocuta crocuta*. By utilizing by-catch camera trap data collected annually over multiple years (2017-2023), the study found that environmental factors such as elevation, terrain ruggedness, and anthropogenic influences like road density and proximity to buildings influence brown hyaena occupancy. The findings reveal a dynamic relationship between these factors and brown hyaena occupancy, with variations in habitat use across different years. The introduction of large predators appears to result in a decline in brown hyaena occupancy, suggesting a potential increased competition, particularly from spotted hyaenas. The study supports the previous findings that brown hyaena avoid areas with increased human activity. This study highlights the importance of considering species-specific habitat requirements of cryptic species in conservation management, particularly in areas where ecotourism and human activities are intensifying.



THURSDAY, 3 SEPTEMBER 2026

Conservation genetics, connectivity, and population dynamics in a fragmented world

K4

Keynote: Host-pathogen associations in the genomics era: New tools for the study of coevolution

Sandi Willows-Munro

Centre for Functional Biodiversity, Discipline of Biological Science, University of KwaZulu-Natal, Pietermaritzburg, South Africa

Presenting author: Sandi Willows-Munro (willows-munro@ukzn.ac.za)

Wild birds harbour a diverse range of pathogens, including viruses, bacteria, fungi and parasites, many of which can affect the respiratory, digestive and nervous systems. As mobile hosts, birds can act as reservoirs and vectors of infectious agents, creating important interfaces between wildlife, livestock, agriculture and human health. Despite their potential significance in the OneHealth framework, pathogen surveillance in wild bird populations remains limited, particularly where conventional diagnostic approaches are constrained by the diversity of pathogens that may be present.

In this talk, I present a novel genomic approach for simultaneously screening wild birds for 65 known avian pathogens. By leveraging genomic data, this approach enables broad-spectrum pathogen detection and provides insights into the diversity and distribution of infectious agents circulating in wild bird populations. Importantly, these analyses also identify patterns of co-infection, revealing associations among pathogens that may otherwise remain undetected through targeted surveillance.

These findings provide new perspectives on host–pathogen interactions and disease dynamics in wild birds, while demonstrating the potential of genomic surveillance as a powerful tool for wildlife disease monitoring. The approach has important implications for wildlife conservation, disease risk assessment, early pathogen detection and biosecurity, particularly at the interface between wild birds, domestic animals and

**F39****UAVs in Rhino Conservation: From Monitoring to Ecological Insights****Jannie Swanepoel¹**¹ *Sanbona Wildlife Reserve, South Africa*Presenter: Jannie Swanepoel; monitor@sanbona.com

Understanding spatial ecology and habitat suitability is critical for the effective management of reintroduced megaherbivores within fenced reserve systems. This study evaluated the application of unmanned aerial vehicles (UAVs) as a monitoring platform for black rhinoceros (*Diceros bicornis bicornis*) at Sanbona Wildlife Reserve and resulted in unexpected insights into habitat use and spatial distribution.

Historically, rhino monitoring relied on opportunistic sightings and extended ground-based tracking. These approaches are time-intensive, associated with elevated operational risk, and often limited in their ability to generate consistent spatial data for ecological analysis. The integration of UAV technology enabled more systematic detection of individuals while simultaneously improving the collection of detailed spatial observations.

A twelve-month monitoring period was used to assess the contribution of UAV-assisted observations to spatial ecological analysis. UAV surveys increased sighting reliability and reduced search effort relative to conventional tracking approaches, while providing georeferenced location data suitable for landscape-level analysis. Rhino occurrence records obtained during UAV operations were integrated with high-resolution vegetation maps to examine spatial patterns of habitat use across the reserve. Spatial overlays allowed for the identification of vegetation communities and terrain features most frequently associated with rhino presence, providing insight into habitat preference and resource selection.

The integration of UAV-derived observations with habitat mapping enabled a transition from individual-based monitoring to landscape-scale ecological assessment. This framework provides a practical method for evaluating habitat suitability, identifying ecologically comparable vegetation types, and informing range expansion and land acquisition strategies. The findings demonstrate the value of integrating emerging monitoring technologies with spatial analysis to support adaptive management and long-term conservation planning for black rhinoceros within managed protected areas.



F40 Free-Roaming Cheetah Census

Marna Smit¹, Nynke Wemer² and Dylan Dobbins³

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³ *Cheetah Outreach Trust*

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Despite their conservation importance, estimates of the free-roaming cheetah population remain highly uncertain. Initial assessments from 2002 relied mostly on expert opinion with limited empirical data and have remained largely unchanged for over two decades, despite substantial declines in African wildlife populations. National policy documents continue to acknowledge the absence of reliable estimates, highlighting a critical knowledge gap.

To address this, Ashia Cheetah Conservation initiated the Free-Roaming Cheetah Census in 2021, a multi-year collaborative effort (2021–2026) with Cheetah Outreach Trust and the University of Groningen. The project spans approximately 99,800 km² across the Northern Cape, North West, and Limpopo provinces. Fieldwork integrates socio-ecological and biological approaches, including structured landowner interviews to assess perceived predator presence and conflict, systematic camera trapping for cheetah detection and individual identification, genetic sampling through scat and blood collection, and GPS collaring to evaluate cheetah movement patterns and landscape fragmentation.

Findings resulting from ~5.2 million camera trap images, 299 questionnaires, 106 confirmed cheetah scats, 33 blood samples, and spatial analysis from 20 collared individuals highlight the challenges faced by free-roaming cheetah in this highly modified, human-dominated landscape, where ecological connectivity is increasingly constrained.

The census' most significant findings were the South African range division and contraction, and total cheetah individuals. The area is divided into two very separate regions in which, confirmed by this census, only <100 mature individuals reside. These results support updating the IUCN range for southern African cheetah in South Africa with a more ground truthed approach.



F41

Natural enemy abundance and predation pressure on *Thaumatotibia leucotreta* across natural and orchard landscape gradients**Elroy Sekgoka¹, Lourens Swanepoel¹, Sean Moore^{2,3} and Tshililo Mphephu¹**¹ SARChI Chair in Biodiversity Value and Change, University of Venda, Thohoyandou, South Africa² Citrus research international, Walmer, Gqeberha, South Africa³ Centre for Biological Control, Rhodes University, Makhanda, South AfricaPresenter: Elroy Sekgoka; Elroy6525@gmail.com

Ground-dwelling predatory arthropods prey on the pupal stages of soil-pupating insect pests in many agroecosystems, but their effectiveness in suppressing pest populations is strongly influenced by landscape structure and management intensity. In citrus systems, this role remains poorly understood. This study examined how adjacent natural habitats influence the abundance and activity of ground-dwelling predatory arthropods and their effects on predation of false codling moth (FCM) pupae, *Thaumatotibia leucotreta* (Meyrick) (Lepidoptera: Tortricidae). The study was conducted across four citrus orchards in Limpopo Province differing in pesticide usage intensity. Predator abundance was quantified using pitfall traps deployed along transects extending from natural vegetation into orchard interiors. Predation of FCM was assessed using sentinel pupae shallowly buried in petri dishes within bait traps positioned at offset distances along the landscape gradients to minimise interference with pitfall sampling. Community composition was explored using non-metric multidimensional scaling (NMDS) to assess spatial variation in predator assemblages. Predator abundance and pupal predation declined with increasing distance into orchard interiors, particularly in intensively managed orchards, whereas low-input orchards supported higher predator activity and predation rates. Adjacent natural habitats maintained high predator abundance and predation levels, highlighting their role as sources of beneficial arthropods. NMDS indicated shifts in community composition along the landscape gradient in response to habitat type. These findings demonstrate that landscape context and management practices strongly regulate predator-mediated suppression of FCM pupae. Protecting adjacent natural habitats and reducing pesticide usage within orchards can therefore enhance conservation biological control and strengthen pest regulation in citrus agroecosystems.



F43

Abundance, spatial distribution, and demographic structure of southern giraffe (*Giraffa giraffa*) in the Tuli region, Botswana

Gabriella R. M. Leighton¹, Katherine Ahl², Julian Fennessy^{2,3}, Rigardt Hoffman^{1,2}, Courtney Marneweck^{2,4}, Daniel M. Parker¹, Emma Wells² & Michael Brown²

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Presenter: Gabriella R. M. Leighton; gabi.leighton1@gmail.com

Southern giraffe (*G. giraffa*) were largely extirpated from Botswana's Tuli Block through illegal hunting in the 1960s and have since been reintroduced through translocation. Despite their ecological significance within the Greater Mapungubwe Transfrontier Conservation Area, no systematic population assessment has been conducted, limiting the evidence base for regional management. In April 2024, the first replicated photographic road survey of southern giraffe across the Northern Tuli Game Reserve and Central Tuli in Botswana was conducted, using a large-scale, systematic approach to collect recapture data of uniquely identifiable individuals. We recorded 1,567 detections and identified 776 unique individuals using the GiraffeSpotter (Wildbook) pattern-recognition platform. Recaptures were sufficient for mark-recapture analysis, with 29% of individuals detected on more than one occasion. After filtering for known sex and age class, 646 adults and subadults were used for density estimation. We applied a Bayesian spatial capture-recapture model with an Inhomogeneous Poisson Point Process density surface, modelling density as a function of proximity to perennial rivers (0 – 17.2 km) and woody biomass (5.7 – 47.9 Mg/ha). Preliminary results indicate a density of approximately 1.15 southern giraffe per km² (N approximately 1,539; 95% CI 1,388–1,722). Density was higher in areas closer to rivers with lower woody biomass, likely reflecting selection of more open, high food resource areas. The population was strongly adult- (~79%) and female-biased (~67%). This study provides the first robust density estimate for this reintroduced population, establishing a baseline for monitoring population trajectory and informing transboundary giraffe conservation across the Greater Mapungubwe TFCA.

**F44****The relationship between the gut microbiome and contact networks in Cape buffalo in Kruger National Park****Channen Long¹, Juan Scheun¹, Anna Jolles², Holly Arnold³ and Brianna Beechler⁴**¹*BioPulse Research Group, Department of Nature Conservation, Tshwane University of Technology, Pretoria, South Africa*²*Department of Integrative Biology, Oregon State University, Corvallis, United States of America*³*Arnold Lab, Department of Biomedical Sciences, Carlson College of Veterinary Medicine, Oregon State University, Corvallis, United States of America*⁴*Carlson College of Veterinary Medicine, Oregon State University, Corvallis, United States of America*Presenter: Channen Long; channen1221@gmail.com

The gut microbiome plays a fundamental role in host health, immunity, and disease, yet the ecological processes that shape microbial communities in wild ungulates remain poorly understood. In social mammals, direct contact between individuals creates opportunities for microbial transmission, suggesting that social network structure may be an important driver of gut microbiome composition. These patterns will also provide insight into disease transmission across wildlife species. However, this relationship has rarely been examined in African wildlife, where infectious diseases such as foot-and-mouth disease circulate within complex social systems. Cape buffalo (*Syncerus caffer*) are an ideal model species to investigate these dynamics. As highly social, gregarious ungulates and important reservoir hosts for multiple pathogens, they offer a tractable system in which to explore the interplay between social behaviour, microbial ecology, and disease. This study uses a population of captive buffalo to characterise the relationship between individual contact networks and gut microbiome diversity and composition. GPS telemetry collars were used to derive proximity-based contact networks, quantifying the frequency and duration of inter-individual associations. Concurrently, gut microbiome profiles are generated via 16S rRNA amplicon sequencing of 500 faecal samples. Network metrics — including degree, centrality, and clustering — will be assessed against measures of microbiome similarity (beta diversity) to determine whether socially connected individuals share more similar microbial communities.

This work will contribute to our understanding of microbiome and pathogen transmission ecology in free-ranging African ungulates and inform broader questions about how social structure mediates disease risk in wildlife populations.

**F45****Inferred and predicted connectivity among disjunct Natal red duiker
(*Cephalophus natalensis*) populations****Frederik J van Heerden¹, Deon de Jager², Anri van Wyk¹, and Paulette Bloomer¹**¹ *Molecular Ecology and Evolution Programme, University of Pretoria, South Africa*² *Globe Institute, University of Copenhagen, Denmark*Presenter: Frederik van Heerden; frederikjvanheerden@gmail.com

The Natal red duiker (*Cephalophus natalensis*) is an elusive species of southern African antelope with a discontinuous distribution in forest habitats that are naturally and anthropogenically fragmented. Here results are presented from a study into the phylogeography of the species, based on sampling from four localities in South Africa and one in Mozambique. Dung samples were collected from disjunct populations in KwaZulu-Natal, Mpumalanga and Limpopo provinces, including the unique Soutpansberg formation of northern Limpopo. Additional tissue material was donated from a hunting operation in the Zambezi Delta. Analyses of mitochondrial DNA sequences, and preliminary insights from a small panel of nuclear microsatellite markers, revealed populations with unique genetic variation, particularly in the Soutpansberg, that historically were connected via gene flow. The observed patterns are consistent with the understanding of South African forests as isolated or fragmented forest patches in a matrix of other ecosystem types. Additional observations from ecological niche modelling demonstrate potential shifts in the species' distribution and connectivity between areas that accompany changes in the African climate. These findings have further implications for the historical and future evolutionary trajectory of the species, potentially including the need to manage unique variation observed in some of these disjunct

**F46****Cheetah avoidance of lions at the feeding site scale: a multi-dimensional study.****Sébastien A. P. Dupray¹, Graham I. H. Kerley¹ and Liaan Minnie^{1,2}**¹ *Centre for African Conservation Ecology, Department of Zoology, Nelson Mandela University, Gqeberha, South Africa*² *Ecological Research Group, School of Biology and Environmental Sciences, University of Mpumalanga, Mbombela, South Africa.*Presenter: Liaan Minnie; liaan.minnie@gmail.com

Subordinate predators are expected to display niche segregation across one or more niche axes to reduce competition with dominant predators. This segregation should be more pronounced during riskier activities, such as feeding, which can attract dominant competitors. Cheetah suffers from kleptoparasitism and intraguild killing from other African large carnivores. While large-scale niche segregation (e.g., home and core ranges, activity pattern) between cheetahs and larger carnivores are well described, the strategies employed by cheetahs to reduce encounter risks at the 4th-order (feeding site) scale has been overlooked. Using GPS-collar data for 14 cheetahs and 11 lions, we tested the hypothesis that cheetahs would exhibit stronger spatial, temporal, and spatio-temporal avoidance of lions at the feeding site scale than at broader core- and home range scales. Cheetahs increased temporal avoidance of lions at the feeding site scale (55% overlap) relative to their activity at broader scales (71% overlap). In contrast, there were no differences in spatial or spatio-temporal segregation with lions between the feeding-, core- and home range scales. In addition, cheetahs did not feed in habitats with lower visibility than what was available within their core- and home ranges. Finally, they did not reduce their probability of feeding after lion presence. Thus, although cheetahs employ both temporal and spatial responses to reduce intraguild risk at larger scales, they increase temporal segregation with lions at finer scales, likely to reduce the risk of kleptoparasitism.



F47

Complex legacy of natural and human-mediated genetic mixing in the common eland (*Tragelaphus oryx*)**Deon de Jager^{1,2}, Ian Rushworth³ and Paulette Bloomer¹**¹*Molecular Ecology and Evolution Programme, University of Pretoria, South Africa*²*Globe Institute, University of Copenhagen, Denmark*³*Ezemvelo KZN Wildlife, South Africa*Presenter: Paulette Bloomer; paulette.bloomer@up.ac.za

The common eland (*Tragelaphus oryx*) is a widespread, highly adaptable African antelope. Three subspecies were proposed based on regional phenotypic features: The Cape eland (*T. o. oryx*; southern Africa), Patterson's eland (*T. o. pattersonianus*, eastern Africa), and Livingstone's eland (*T. o. livingstonii*; between southern and eastern Africa). Previous analysis of mitochondrial DNA sequences distinguished an East African and southern African lineage, but with no conclusive evidence of a third lineage consistent with Livingstone's eland. Here we present mtDNA data (n=320) across the African range (our and previous data) and nuclear microsatellite data (10 loci) for southern Africa (n=217), with the aim of improving our understanding of differentiation in the species. MtDNA analyses show two extensive haplogroups in East and southern Africa, with limited mixing between the regions. In addition, there are two localised sets of divergent haplotypes from southern Zimbabwe, and southern Zimbabwe and Mapungubwe, respectively. Haplotypes of individuals originating from Zimbabwe are found throughout a haplotype network, pointing to the region as a likely natural area of secondary contact over longer time periods. Genotype analyses show a complex pattern of diversity with some sampled populations assigning to a single genetic cluster, whereas others appear to be the result of intermixing at natural contact zones or due to human-mediated movement. Future research must include more reference material from Angola, Zambia, and Mozambique and analyse nuclear data for all regions, to improve our genetic understanding of the species and how this impacts management.



F48

Stable gut microbiome diversity across contrasting land uses in a generalist mesopredator, the Black-backed Jackal (*Lupulella mesomelas*)**T. Fourie¹, E. Overton, M. Roberts, H. Fritz^{1,2}, F. Prugnolle^{1,2} and V. Rougeron^{1,2}**¹*International Research Laboratory, REHABS, CNRS-NMU-UCBL, George Campus, Nelson Mandela University, George, South Africa*²*Sustainability Research Unit, George Campus, Nelson Mandela University, George Campus, George, South Africa*³*Department of Conservation Management, George Campus, Nelson Mandela University, George campus, George, South Africa***Presenter:** Tasmin Fourie, tasmin.s.fourie@gmail.com

Anthropogenic changes is a major driver of ecological and evolutionary processes, reshaping not only the distribution and behaviour of species but also physiology, health, and adaptive capability. Increasing evidence suggests that host-associated microbiomes play a central role in mediating organisms' responses to such changes by influencing metabolic systems, immune regulation, and overall fitness. However, while gut microbe adaptations have been studied extensively in omnivores and herbivores, comparatively little is known about carnivores, specifically highly mobile, generalist mesocarnivores that exploit diverse landscapes, including human-modified ones. Here, we investigate how environmental heterogeneity influences the gut microbiome of the black-backed jackal (*Lupulella mesomelas*) in the Greater Karoo, South Africa. Using faecal samples collected across multiple seasons and contrasting land-use types, including a protected reserve with apex predators, a game ranch without large predators, and neighbouring livestock farms, we assessed how ecological context shape microbial diversity and composition. Overall, our results suggest that while gut microbiome diversity in jackals remains relatively stable across heterogeneous landscapes, suggesting a high degree of microbial resilience in this ecologically flexible carnivore. However, we detected shifts in community composition, likely reflecting differences in diet, trophic interactions, and exposure to anthropogenic resources. This study highlights the capacity of generalist mesopredators to maintain stable microbial diversity across heterogeneous landscapes while still exhibiting compositional plasticity.



F49

Mammalian adaptation in South-west Africa

Blessing Sekhwela¹, Mischa Fraser¹, Rasmus Heller², Lourens Swanepoel¹, Stefan Prost³ and Yoshan Moodley¹

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It has long been suggested that populations of widespread mammal species inhabiting xeric south-west Africa are arid-adapted. This idea has gained so much traction in ecology and conservation that we often refer to south-west African populations of species with the prefix “desert”, as in desert rhinos, desert elephants and desert lions. While it is possible that south-west African populations of these species have become locally acclimatised or are simply able to tolerate the consequences of higher aridity, it is also possible that some populations also have become physically adapted through evolution. In the latter case, signatures of adaptation may be apparent in the genomes of individuals sampled in arid locations when compared to conspecifics inhabiting milder climates. In this study, we leverage the growing publicly available genome data bases of several large mammal species, where south-west African populations are well represented. We analysed these data sets using several independent tests for positive selection. We were able to identify regions of the genome where only south-west African populations were under positive selection. Using genome annotations, we flagged the genes involved in selection and their ontology and compared these across species. We believe this work is foundational in demonstrating the link between phenotype and genotype and a first step towards unravelling the nature of mammalian adaptation in arid environments.



F50

Southern giraffe – a tall, complicated story: linking national abundance, spatial ecology and genetics to guide their future conservation in South Africa**Rigardt Hoffman^{1,2}**¹*Giraffe Conservation Foundation, Windhoek, Namibia*²*Oppenheimer Research Chair in Biodiversity Conservation, Faculty of Agriculture and Natural Sciences, University of Mpumalanga, Mbombela, South Africa.*Presenter: Rigardt Hoffman; rig@giraffeconservation.org

Southern giraffe (*Giraffa giraffa*), comprising the Angolan (*G. g. angolensis*) and South African (*G. g. giraffa*) subspecies, represent one of Africa's more complex conservation "success" stories. Although South Africa's giraffe population has increased substantially in recent decades to ~30,000 across all nine provinces, through improved public and private land conservation, the latter accounting for ~50%, critical questions remain regarding the ecological and genetic integrity of these expanding populations.

This study integrates newly collated national abundance and distribution trends, spatial ecology and population genetics to assess the long-term implications of contemporary southern giraffe management in South Africa. Spatial analyses demonstrated that reserve size influences movement behaviour, with smaller fenced reserves associated with restricted ranging patterns and stronger edge effects, highlighting the importance of larger connected landscapes.

Genetic analyses revealed widespread admixture between Angolan and South African giraffe lineages, driven by recent anthropogenic translocations. These findings indicate that human-induced management practices have reshaped population structure and eroded distinct national and regional genomic signatures. Furthermore, emerging archaeological and historical evidence also suggests southern giraffe historically occupied a broader range across South Africa than previously recognised, challenging traditional "natural" versus "extralimital" classifications.

Collectively, these findings demonstrate that increasing population numbers and range of southern giraffe in South Africa alone are insufficient indicators of conservation "success" within a fragmented and intensively managed landscape. Effective and bold conservation actions for southern giraffe will require integrated monitoring, coordinated nation-wide genetic management and improved landscape connectivity to ensure their long-term ecological resilience in South Africa.

**S21****An exploration into the Genomic structure, phylogeography, and connectivity of the bushbuck across the African landscape****Mischa Fraser^{1,2}, Rasmus Heller², and Yoshan Moodley¹**¹*University of Venda, Thohoyandou, Limpopo, South Africa*²*Department of Biology, University of Copenhagen, Denmark*Presenter: Mischa Fraser mischa.fraser@gmail.com

The African landscape ranks among the most biogeographically complex landscape on Earth. Its wildlife carries genetic signatures shaped by ancient climatic shifts, and today, by habitat fragmentation and loss, bushmeat trade, climate change. The bushbuck (*Tragelaphus* spp.) captures this biological complexity, as a widespread highly adaptable antelope that is both generalist and specialist and whose conservation status remains difficult to define due to taxonomic uncertainty. Is the bushbuck one species, two, or many? And does the answer change how we conserve it?

Previous studies proposed two main forms, *SCRIPTUS* and *SYLVATICUS*, along with numerous ecotypes that likely emerged during Pleistocene climate oscillations, these conclusions relied on limited mitochondrial and nuclear markers and small sample sizes, leaving critical questions unanswered. How connected are bushbuck populations across Africa? Where does gene flow occur? And how deep is genomic divergence across landscapes?

Here we address these gaps using whole-genome data from more than 100 individuals spanning 19 haplogroups across the African continent. ADMIXTURE and principal component analyses revealed population structure at many levels, while an IBS neighbour-joining tree provided a means to view relationships among and within structural groups. We investigated gene-flow between lineages and mapped barriers to gene flow using Estimated Effective Migration Surfaces (EEMS).

This work contributes not only to understanding bushbuck evolution and taxonomy but also, provides valuable insights into potential barriers to gene flow, contributing to our understanding of the bushbuck's population dynamics and range, each representing a valuable conservation unit for management in sub-Saharan Africa.

**S22****Heterogeneity in elephant 'pressure' from their space use and activity:
First lessons from an ongoing study in Hluhluwe-iMfolozi Park****Simon Chamaillé-Jammes¹ and Siphesihle Mbongwa²**¹*CEFE, Univ Montpellier, CNRS, EPHE, IRD, Montpellier, France*²*Ezemvelo KZN Wildlife, Scientific Services, Hluhluwe-iMfolozi Park, South Africa*Presenter: Simon Chamaillé-Jammes; simon.chamaillie@cefe.cnrs.fr

For decades, the management of locally large elephant populations in protected areas has been focused on maintaining a given park-level density through direct interventions such as culling, translocations or contraception. Another paradigm however emerged, one that suggests that managing heterogeneity in elephant numbers and elephant impacts, rather than elephant numbers *per se*, could be more appropriate for protected areas aiming at conserving functional ecosystems. Assessing the validity of this paradigm however first requires gaining a strong and comprehensive understanding of the drivers of elephant movements and distributions across time scales, from days to seasons, as well as of their activity patterns in time and space (e.g. where do they forage relative to where they go?). This will naturally bring questions about whether managers can manipulate the observed patterns.

In this talk, we will present results from an ongoing study conducted in Hluhluwe-iMfolozi that addresses this research topic. Using GPS data from over 30 elephants tracked simultaneously, as well as camera-trap data from a large grid, we will report on several aspects of heterogeneity in elephant space use and activity across the park. For instance, we will show how 'elephant pressure' at a site is only related to the number of herds visiting this site. We will also show how sociality is likely a strong but overlooked driver of space use that could influence number-focused management policies. Ultimately, our study helps developing further the framework of heterogeneity-based elephant management.



S23

Scats vs. Sightings: Contrasting Methods of Diet Assessment of the Waterberg Wild Dogs

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The free-roaming population of African wild dogs (*Lycaon pictus*) in the Waterberg persists unmanaged in a fragmented landscape where wide-ranging habits increase exposure to anthropogenic pressures. Human-wildlife conflict in the region stems from the real and perceived stock losses of both livestock and game. This study assessed diet using complementary approaches, long-term observational records, and DNA metabarcoding. The observational data provided insight into prey demographics, such as age and sex. For the DNA metabarcoding, scats were collected over one year, including a denning period during which supplemental feeding was implemented. The metabarcoding detected a broader spectrum of prey species, including those not commonly detected in observational studies. Across both methods, diet was dominated by medium-sized ungulates, with impala (*Aepyceros melampus*) as the primary prey species outside of the denning season. During the denning season, the dominant prey species shifted to common warthog (*Phacochoerus africanus*), which was the most provisioned species in the supplemental feeding. Despite this shift, there was no significant seasonal difference in prey composition, and prey use reflected relative availability, rather than specialisation in any one species. The DNA metabarcoding indicated that livestock did not form part of the Waterberg wild dog diet over the course of this study. This emphasizes that the perceived impacts on livestock and game held by many landowners may be disproportionate to actual predation patterns. The communication of locally derived evidence may be key in improving landowner tolerance; however, this approach may not be sustainable in all wild dog populations.

**S24****The utility of systematic camera trapping for assessing ungulate occupancy in semi-arid Namibia****Thapelo Matsane¹, Stephanie Périquet-Pearce², Karen Codling³ and Daniel Parker⁴**¹ UMP-Oppenheimer Research Chair in Biodiversity Conservation, University of Mpumalanga, Mbombela, South Africa² Panthera, Cape Town, South Africa³ AfriCat Foundation, Otjiwarongo, Namibia⁴ UMP-Oppenheimer Research Chair in Biodiversity Conservation, University of Mpumalanga, Mbombela, South AfricaPresenter: Thapelo Matsane, 201980541@ump.ac.za

Wildlife and conservation managers need reliable information to understand the ecological and management-related predictors of ungulate habitat use. Our study applied occupancy modelling and systematic camera trapping to evaluate how biotic and abiotic factors influence ungulate habitat use in a semi-arid fenced system. The study assessed the occupancy of four ungulate species: springbok (*Antidorcas marsupialis*), giraffe (*Giraffa giraffa*), kudu (*Tragelaphus strepsiceros*) and mountain zebra (*Equus zebra*) on Okonjima Nature Reserve (ONR), Namibia during the dry season (September/October) of 2024. A camera trap survey was conducted across 53 camera stations for 61 days and we used a single-season occupancy modelling framework to assess the probability of ungulate species space use in relation to several ecological (i.e., grass cover, woody cover, terrain ruggedness, slope, elevation, habitat type) and environmental (i.e., fire frequency, distance to water, distance to roads) covariates. Preliminary results indicate that distance to water and forage-related variables are the most important drivers of ungulate occupancy at our site. These preliminary findings suggest that the habitat use of ungulates is likely determined by the availability of resources and can inform management decisions on issues such as waterhole management, seasonal resource protection and the protection of targeted habitats such as high-quality foraging areas.



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