

PRESENTATION ABSTRACTS: TUESDAY, 7 OCTOBER

Conservation health: Integrating a “One Well-Being” approach in elephant conservation

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Presenter: Antoinette van de Water, antoinette@bteh.org

Abstract: Innovative conservation approaches are urgently needed to balance species conservation and slow biodiversity decline with human development. Safeguarding elephant populations often involves active management, leading to direct intentional, direct unintentional, and indirect consequences for animals, people, and ecosystems. Drawing from One Health and One Welfare principles, our study introduces a multicriteria framework for developing conservation strategies that enhance well-being across dimensions. This approach establishes priorities, acceptability zones and One Well-being scores that guide decision-making towards optimal outcomes. We applied our One Well-being framework to evaluate twelve elephant management interventions currently or historically used in South Africa. Examining data from 3,306 instances of these interventions, including on-the-ground data, we assessed their relative impact on environmental, human, and animal well-being. Our analysis identified 250 consequences of these interventions, categorised as 58 direct intentional, 127 direct unintentional, and 65 indirect. While most direct intentional consequences were beneficial (93.4%), the direct unintentional and indirect consequences were predominantly harmful (96.9% and 75.4%, respectively). Although most interventions improved environmental well-being, their consequences for animal and human well-being were less positive. This highlights a conflict among the three well-being dimensions, underscoring the importance of incorporating human and animal well-being into elephant management strategies. Recognising the interconnected nature of these dimensions, and aiming for multiple, mutually reinforcing gains, is imperative. This iterative process helps address socio-ecological vulnerabilities and risks while advocating for ethical conservation

practices, fostering multidisciplinary collaboration, and garnering broader support for conservation efforts. Our approach aligns with global goals for sustainable and equitable wildlife management outcomes.



Antoinette van de Water

Lessons learned during exporting a breeding herd of African elephant from Namibia to the United Arab Emirates

Hans-Otto Reuter

Private Wildlife Veterinary Practitioner: African Wildlife Services, Windhoek, Namibia

Presenter: Hans-Otto Reuter, vet@wildlife.com.na

Abstract: In 2021 the Namibian Ministry of Environment, Forestry and Tourism offered 170 African elephant for sale on public tender, subject to strict conditions and permit requirements. After a suitable herd was selected, the elephant were sold and transported to the United Arab Emirates by plane. This project required complex logistics and while the team had experience with similar projects, many challenges arose due to the number of animals, timing of permits and distance travelled. The presentation explores various challenges and unexpected events that were encountered during the implementation of this complex translocation project, how these were overcome and invaluable lessons that were learned from these. As translocations are becoming more important for reintroducing wildlife to their former ranges, they are an increasingly important tool for wildlife management in Southern Africa and beyond. The lessons learned give unprecedented insights into the complexities of game capture, transport, boma holding and trans-boundary translocations by air.

Spatial and disease ecology of wild koalas (*Phascolarctos cinereus*) on A private reserve in Southeast Queensland, Australia

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Presenter: Gabriella Leighton, gabi.leighton1@gmail.com

Abstract: Understanding regional variations in species-habitat relationships is important for developing effective conservation strategies, particularly in areas of increasing human pressure. Koalas (*Phascolarctos cinereus*) are arboreal marsupials highly vulnerable to anthropogenic transformation. In Queensland, the Hidden Vale property connects priority koala habitat between the south-west and the coast. The resident koala population is well-placed to maintain connectivity but is threatened by habitat loss and fragmentation due to urban development and associated threats, such as high disease prevalence. Here, we use a large, long-term dataset of koala movement on a > 48km² private multiuse reserve to investigate the impact of demographics, environmental variables, disturbance (including roads, grazing, and recreation), and health status on koala home range, habitat selection and dispersal behaviour. From 2018 – 2023, 46 koalas (n = 24 females, n = 22 males) were GPS collared (818 ± 649 locations per individual) and disease tested. Over half of these individuals tested positive for chlamydiosis, and collared individuals experienced high mortality due to the disease (67%, 12/18 deaths). We estimated home ranges and time use metrics for a subset of these individuals. We found significant differences in home range size, revisitation and visit duration between demographic groups, where males had larger home ranges overlapping several females. Home range characteristics were also influenced by disease status and whether an individual was resident or translocated. This suggests that prevention and treatment of disease, as well as maintaining quality koala habitat, are vital conservation interventions for this highly threatened species.



Gabriella Leighton

Developing resource saving guidelines as a tool for improved release success of rescued pangolins

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Presenter: Kelsey Prediger, director@pangolincrf.org

Abstract: Pangolins, the most trafficked mammal worldwide, endure the horrors of the illegal wildlife trade, often surviving in prolonged periods without sustenance. This study aims to improve the assessment, care, and survival of rescued pangolins by providing preliminary guidelines on body scoring, release, and post-release monitoring. By analysing data from wild pangolins during a severe drought and health observations of confiscated individuals, this research sheds light on strategies to enhance release or translocation success. The study examines data from 16 deceased wild pangolins over a drought period and compares it with observations from 28 monitored releases of rescued pangolins. Central to the assessment process is body scoring, which proves instrumental in evaluating the general health status. Malnutrition and starvation often lead to secondary diseases, necessitating veterinary intervention prior to release. Each pangolin has experienced different circumstances since being poached from the wild, impacting survival post-release including habitat variables and competition, thus decisions must be tailored to individual circumstances. In resource-constrained scenarios, basic veterinary interventions can significantly improve release success rates. Additionally, non-invasive post-release monitoring methods can contribute to enhanced survival chances. Trends observed in both datasets emphasize the importance of accurately understanding overall individual health, habitat requirements and biological sensitivity of the species for successful release or translocation. This interdisciplinary approach merges ecological data with veterinary insights to develop efficient guidelines for pangolin rescue and release programs, aiding conservation efforts to mitigate the impact of illegal trafficking on pangolin populations and ensure their long-term survival in the wild.

Incorporating wildlife veterinarians into everyday conservation – The Giraffe Conservation Foundation Conservation Health Initiative

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Presenter: Sara Ferguson, sara@giraffeconservation.org

Abstract: Traditionally wildlife veterinarians' involvement in wildlife conservation efforts has been limited to wildlife immobilisation, disease monitoring, and capture operations. However, wildlife veterinarians can provide unique perspectives as well as have a wealth of knowledge that should be incorporated into wildlife conservation efforts. The Giraffe Conservation Foundation's (GCF) Conservation Health Initiative bridges the gap between wildlife veterinary medicine and conservation to create a more holistic approach to giraffe conservation and management. This initiative incorporates a wide range of aspects, including research into the best immobilisation practices for giraffe, enhancing capacity building of the next generation of Africa's wildlife veterinarians through hands on training courses, trials of new technology for satellite tracking providing development support, and assessing disease threats and health issues in wild giraffe populations. We believe incorporating African wildlife veterinarians into the conservation team not only enhances the overall project, but reinforces the strength, success, and longevity of multidisciplinary conservation programmes.

Lead Exposure in Captive and Wild Cheetahs (*Acinonyx jubatus*) and Leopards (*Panthera pardus*) in Namibia

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Presenter: Catherine Hauw, catherine.hauw@gmail.com, chauw22@rvc.ac.uk

Abstract: Lead exposure is a global concern due to its harmful effects on the environment, animals, and humans. While substantial research on lead poisoning in humans, raptors, scavenging birds, and waterfowl exists, literature on potential risks for mammalian scavengers and carnivores is limited. Only three cases of suspected lead poisoning in captive cheetahs have been documented, and none in the wild. We quantified cumulative life exposure to lead in 62 (33M/29F) cheetahs (*Acinonyx jubatus*) and 11 leopards (*Panthera pardus*), two carnivores with different feeding strategies, by analyzing bone lead concentrations (BLCs) in tibias. We grouped cheetahs as a function of time in captivity: captive (<10 months lived in the wild, n=21), mixed-life (n=19) and wild (<1 month in captivity, n=20); all the leopards were wild. We tested the effects of time in captivity, age, and sex on the BLCs. Lead was detected in all the cheetah and leopard tibias. Mean BLC was 1.32mg/kg (SD±1.91) for all cheetahs, with a higher mean (1.65mg/kg ±1.85) in captive, relative to mixed-life (1.46mg/kg ±2.67), and wild cheetahs (0.27mg/kg ±0.39). Age had a significant effect on BLC within each category, with older cheetahs having higher mean BLCs, in particular when captive. There was no significant effect of sex on BLC. Wild leopards had a significantly higher mean BLC than wild cheetahs with a mean BLC of at least 1.01mg/kg (SD±1.56). We attributed the higher BLC in captive cheetahs to exposure to lead from the ammunition used to shoot the ungulates that form their diets. Increased exposure in wild leopards could be attributed to occasional opportunistic scavenging, a behavior not seen in wild cheetahs. This study highlights the need for non-lead ammunition options in support of conservation and animal welfare.



Catherine Hauw

Widespread lead (Pb) exposure of vultures across Kwazulu-Natal

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Presenter: Anel Olivier, anel@wildlifeact.com

Abstract: Vultures in KwaZulu-Natal (KZN), South Africa, are teetering on the brink of local extinction, thus seriously threatening the important ecosystem services they provide. The number of breeding pairs of the cliff-nesting Bearded Vulture and three tree-nesting vulture species have declined by an average of 11% since 2012. Studies show that poisoning through the ingestion of lead fragments from carrion is a growing risk to vulture populations, with an additional risk of lead fragments being fed to chicks, which lowers the chances of fledging success. To better understand the extent of lead exposure in vultures across KZN, samples of multiple species and age classes have been tested for blood and bone lead levels since 2019. This study builds on preliminary findings that revealed 32,4% (n=34) of all vultures have elevated blood lead concentrations ($\geq 10\mu\text{g/dL}$), and the average lead concentration in African White-backed Vulture bones raises concern of long-term exposure ($4,07\pm 5,02\ \mu\text{g/g}$, n=74). Further analyses included a larger sample size (n=216) across KZN, as well as GPS tracking data to assess potential lead threat hotspots and impacts of lead on their movement behaviour. Given that vulture populations are rapidly declining locally and globally, it is essential to avoid any additional sources of mortality or reduced performance such as from lead poisoning. The extent of lead exposure of KZN vultures is high, and therefore evidence-based decisive and timeous action is required to remove this threat. Achieving this will require strategic and ongoing collaboration between all stakeholders across this complex landscape.



Anel Olivier

What we do and don't know about rhino dehorning: A systematic review of the literature

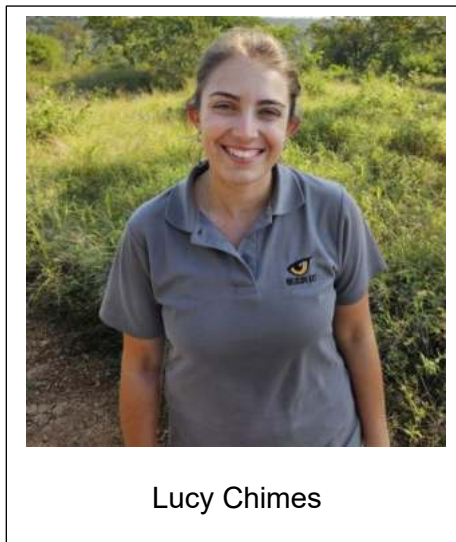
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Abstract: High, persistent poaching is presently one of the primary threats to both African rhinoceros (*Diceros bicornis* and *Ceratotherium simum*; hereafter rhino) species, particularly in southern Africa. In an attempt to deter poachers and thus reduce the rate of decline, the use of dehorning, the controlled removal of a rhino's horns, is becoming increasingly widespread. However, to ensure that this conservation intervention is both effective and does not adversely impact rhino population dynamics, it is essential to have a clear understanding of its effects. We conducted a systematic review of 1024 literature articles published before May 2024, focusing on the historical and present understanding of rhino dehorning. In recent years there has been an increase in the number of publications, with 65.4% published since 2010. Early publications were primarily focused on veterinary techniques and anecdotal evidence. In contrast, the theme of recent studies has shifted towards assessing the effects of dehorning on reproductive parameters, ecology and the viability of a sustainable horn trade. Despite this progress, one of the major limitations across many publications was a small sample size, often restricted to just one or a few populations close to each other, thus reducing the application of results to other areas. Additionally, no analyses have been conducted on the possible displacement of poaching pressure from dehorned to horned populations. Addressing these gaps through further research is crucial for the successful and sustainable conservation of both white and black rhino populations worldwide.



Identifying areas of high snaring risk in Kruger National Park: A novel citizen science approach for carnivore conservation

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Presenter: Robert Davis, robdavis1104@gmail.com

Abstract: Wire snares are a frequently-used method for illegal bushmeat poaching and are increasingly recognised as a global threat to biodiversity. For large carnivores, wire snares can negatively influence population persistence through both prey depletion and direct mortality and injury from snaring bycatch. However, studies investigating the underlying drivers of snare placement and areas of increased likelihood of detecting snared animals are lacking, particularly in fenced protected areas. We estimated the occurrence of large carnivore snaring incidents in Kruger National Park, South Africa, using citizen science records reported on social media pages. Using occupancy modelling to account for imperfect detection, we assessed the drivers of snare occurrence and predicted areas of high snaring risk across the protected area. Our results suggest that the probability of snared large carnivores increases with proximity to areas of higher human activity. Specifically, snare occurrence is significantly higher at the reserve boundary in areas that are bordered by human settlements. Prey biomass also influenced the probability of snare occurrence, with snared carnivores significantly more likely to occur in areas of lower prey biomass. Our findings suggest that areas of increased accessibility are the primary motivator for snare placement in fenced reserves, rather than ecological and environmental considerations. Spotted hyaena were the most frequently observed snared large carnivore, in accordance with previous literature that suggests snare bycatch may be an underrepresented threat to the species' survival. Our novel approach can be used to predict areas of increased snare occurrence and inform applied law enforcement and mitigation strategies.

**Effect of anthropogenic environment on the gut microbiome of chacma baboons
(*Papio ursinus*)**

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Presenter: Célia Lacomme, celia.lacomme@univ-lyon1.fr

Abstract: Anthropogenic processes, defined as the transformation of natural landscapes by human activities, are increasing worldwide and are significantly affecting living organisms. These transformed landscapes not only decrease natural areas used by wildlife, but also create new ecological niches, food resources and environmental stressors. Consequently, these changes may have profound consequences on behavior, physiology and morphology of wildlife inhabiting anthropized areas. While there is a growing interest in understanding how urbanization impacts the gut microbiome, which plays a key role in wildlife health, there remains a lack of knowledge, especially in wild non-human primates. In this study, we determined the composition of the gut microbiome of chacma baboons (*Papio ursinus*) from 500 fecal samples of 30 wild troops across a gradient of anthropization in Western Cape province of South Africa. By sequencing the amplicons of the V4 region of the 16S rRNA gene, we compared the diversity and abundance of gut bacterial communities at population level. In addition, we investigated how the gut microbiome of chacma baboons can vary along this gradient, determined by landscape analysis. Our findings shed light on how anthropogenic landscapes may alter the gut microbial composition and diversity in chacma baboons, which may influence their health directly or indirectly through different cascading effects (e.g. parasite infections, ...). From a global perspective, this study contributes to a better understanding of the consequences of habitat loss on wildlife health and ecosystem dynamics. This will also improve the conservation strategies of urban species in order to better manage human-wildlife conflicts.



Célia Lacomme

Trouble in paradise: When two species of conservation and cultural value clash, causing a management conundrum

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Abstract: Threatened species throughout the world are in decline due to various causes. In some cases, predators of conservation or cultural value are causing the declines of threatened prey, presenting a conservation conundrum for managers. Marine turtle nests on K'gari (formally known as Fraser Island), Australia, were surveyed to investigate predation of green and loggerhead turtle nests, where each of these species are of conservation value. Monitoring revealed that 84% of nests were predated by dingoes. Only 16% of nests were not consumed by dingoes or other predators, and only 5.7% of unprotected nests were confirmed to have successfully hatched. Up to 94% of nests were consumed in some areas, and predation rates were similar across different dingo packs. Information on the available numbers of nests and dingoes in the area indicated that turtle nests alone are sufficient to support extant dingoes over the summer. These results indicate that marine turtle eggs represent a previously unquantified but important food source for dingoes on K'gari, and that turtle nests at this rookery site are under serious threat from dingoes. Managers interested in turtle conservation should prioritise protection of turtle nests from dingoes or potentially risk losing the entire rookery forever in the near future.



Linda Behrendorff

The effect of spotted hyena loss on carcass availability for threatened vultures

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Presenter: Karl Sebastian Fester, karl.fester@uq.edu.au

Abstract: The global vulture crisis may be exacerbated by the ongoing decline of large terrestrial mammalian carnivores, which are a main source of natural carcass facilitation for vultures. This erosion of natural carcass facilitation by large carnivores could compound the threats of food availability declines and safe food sources for vultures. Here, we compared carcass availability to, and use by, vultures on thirteen private-protected areas across Namibia, on six of which spotted hyenas remain, and from seven of which they have been extirpated. We compared carcass density and size classes between areas with and without this common large carnivore, as well as carcass detectability from above, and vulture use of carcasses. We found no significant difference in carcasses densities, size, or visibility between sites with and without spotted hyenas. However, of 34 camera trap-monitored fresh wildlife carcasses, 50 % of the carcasses at sites with spotted hyenas were used by vultures, while only 17 % at sites without spotted hyenas were used by vultures. Our results demonstrate that when the factors of carcass availability and size remain even, the absence of specific large carnivores such as spotted hyenas may still influence carcass suitability for use by vultures. Therefore, arresting the declines and range contractions of spotted hyenas across southern Africa could positively complement ongoing vulture conservation efforts.



Karl Sebastian Fester

The effect of the perceived risk of spotted hyaena (*Crocuta crocuta*) dens on the movement and distribution of prey and competitively inferior species

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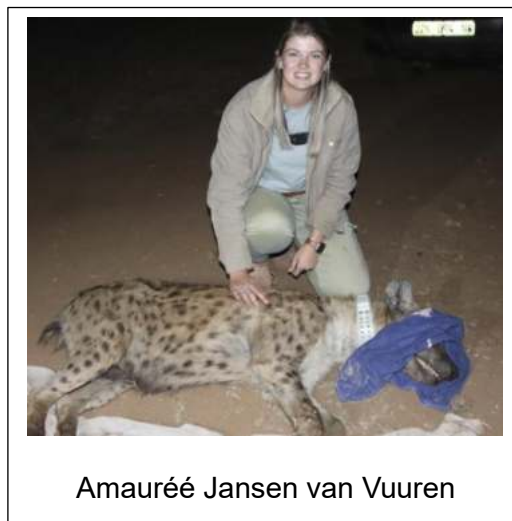
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Abstract: African ecosystems support a diverse variety of predator species and have the highest diversity of large carnivores on Earth. Apex predators play a crucial role in these ecosystems. Through hunting and creating a landscape of fear, apex predators influence the populations and behaviours of smaller predators and prey. According to the mesopredator release hypothesis, the absence of an apex predator leads to an increase in mesopredator populations, resulting in higher predation pressure on their prey and a subsequent decline in prey populations. The spotted hyaena (*Crocuta crocuta*) is a key apex predator with several activity hotspots, the largest being the den, where landscapes of fear may be most pronounced. While there is substantial literature on factors influencing hyaena den site selection, the impact of these dens on the presence of potential prey and competitively inferior species remains underexplored. This study aimed to examine the influence of perceived risk associated with hyaena dens on the occupancy and detection probabilities of prey species within the ecosystem. We used camera traps set up around dens along with Kernel density estimates from collar data to assess these probabilities, providing a detailed analysis of mesopredator and prey species' responses to hyaena activity. Our results indicate a correlation between increased hyaena activity and reduced occupancy and detection probabilities in mesopredator and prey species. These findings suggest that hyaena dens create landscapes of fear, influencing mesopredator and prey species' distribution and behaviour.



Amaurée Jansen van Vuuren

Deployment of SMART empowers practitioners and facilitates the development of a National Protected Area Management System in Namibia

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Presenter: Claudine Cloete, cloete.claudine@meft.gov.na

Abstract: Approximately 17% of Namibia's territory consists of national parks and state concession areas. Due to an increase in threats to biodiversity, it is imperative to have a monitoring tool that contributes to the effective management of protected areas. In the past, several paper-based monitoring tools were employed to measure conservation and law enforcement activities. These tools lacked a geospatial component making reporting cumbersome and effective wildlife management inadequate. With the threat of poaching and other illegal activities, the need to strengthen law enforcement and monitoring patrols was identified.

SMART enables the collection, storage, communication and analysis of field data on biodiversity, illegal activities, patrol routes and management actions. With SMART field data collection, analysis and reporting is fully automated. This allows managers to evaluate patrol teams' performance and aid in the effective deployment of valuable and scarce resources. Since the deployment of this system there has been an improvement in law enforcement activities resulting from empowering and motivating field staff in their daily duties by optimizing the data collection process of patrol teams. Information gathered feeds into the strategic planning to combat illegal activities. The SMART approach enhances law enforcement and monitoring activities and is highly beneficial to a national protected area management system in Namibia.

Automated identification of carnivores: Conservation applications

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Abstract: Tourists and guides across Africa are actively seeking large carnivores and capturing images of them on a daily basis, covering a far wider range than is possible for dedicated researchers and conservationists, who often rely on camera traps to study carnivores. Most African carnivore species are individually recognisable and developments in technology allow coat patterns (e.g. spotted hyaena, African wild dog) and facial features (e.g. lion) to be detected and compared by artificial intelligence to assist in individual identification. The African Carnivore Wildbook (ACW; www.africancarnivorewildbook.org) supports the uploading of images with timestamps and locations from any source; these are then run through algorithms to produce a list of possible ID matches that can be checked by an experienced researcher. Data ownership is maintained for any organisation uploading private data, such as those from camera trapping surveys. The ACW has already been used to improve the accuracy of a dataset of manually identified cheetah and leopard, and to study dispersal patterns in African wild dogs. Applications could extend to topics such as social associations through logging of co-occurring individuals, increasing the accuracy of population estimates and studying population connectivity. Planned developments to the system include accessing images from public online sites and an app to allow offline access to a subset of potential individual matches within a particular area. A broader uptake of this technology and the harnessing of photos taken by citizen scientists would allow wide-scale monitoring of African carnivores across protected areas with minimal effort.



Emily Bennitt

Spotting change: Adaptive management of leopards in South Africa

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Presenter: Gareth Mann, gmann@panthera.org

Abstract: Although there is a growing body of research highlighting the status of leopard populations, this seldom feeds back into management practice. Here we discuss the adaptive management framework developed for leopards in South Africa. This framework uses data from annual leopard population surveys conducted in key sites across KwaZulu-Natal, Limpopo and Northwest provinces. These monitoring data are used as a basis for demarcating Leopard Hunting Zones, which allow relevant conservation authorities to reduce the risk of overharvest from certain populations, as well as to determine whether a hunt permit should be issued for a particular hunting zone. Together with revised regulations for leopard hunting, we believe that this framework has the potential to significantly improve the sustainability of trophy hunting in South Africa. Here we discuss the lessons learned from developing this framework, ongoing challenges, and potential future improvements.



Gareth Mann

Experiences of livestock predation and attitudes towards leopards (*Panthera pardus*) across the Western Cape, South Africa: Using knowledge to inspire innovative solutions

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Presenter: Anita Wilkinson, research@capeleopard.org.za

Abstract: Declines in suitable habitat and prey availability result in people and carnivores increasingly sharing agricultural areas, which frequently leads to predation of livestock and retaliatory killing of carnivores. To promote coexistence between people and carnivores, it is important to understand the processes that guide human-carnivore relationships. Using leopards as a focal species, 309 interviews were conducted with farmers across the Western Cape, South Africa, to explore experiences of livestock predation and attitudes towards leopards. Leopards were ranked as the most damage causing animal by only 9% of participants, compared to 57% and 21% of participants who ranked black-backed jackal and caracal as the most problematic predators. Although 66% of participants had a positive attitude towards leopards, frequent and severe losses attributed to meso-carnivores exacerbated negative attitudes towards all carnivores and increased reluctance towards having leopards on their properties. Leopards were threatened as by-catch in proactive and reactive lethal methods implemented to reduce depredation by meso-carnivores. Employing holistic non-lethal methods will prevent depredation and protect livelihoods, but mitigation tools need to be effective, affordable and easy to employ, thus inspiring the Cape Leopard Trust's Mobi-kraal project. The Mobi-kraal project aims to develop and test a predator-proof, mobile enclosure to improve human-carnivore coexistence across varied agricultural landscapes.

Patrol protections in practice: The effects of anti-poaching strategies on wildlife

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Abstract: Protected areas are a key part of the strategy to preserve wildlife populations in sub-Saharan Africa, but how they are managed is critical to their success. The advent of commercial poaching, partially driven by demand for bushmeat in rapidly growing capital cities and high-value materials like ivory and rhino horn, has intensified the threats to wildlife. Thus, poaching pressure remains high in many areas, and some estimates suggest less than 20% of these conservation spaces are adequately safeguarded. The Kasanka Trust, managing Zambia's Kasanka National Park, is one such organization working to maximize limited resources for wildlife protection while assessing the efficacy of their anti-poaching strategies. To relate wildlife populations to their ranger patrols, we deployed camera traps to 84 sites at randomly selected locations from August 2021-February 2022. We then compared this with tracking data from all patrols conducted from January 2021-January 2022. Our results show that the areas of highest anti-poaching patrol density had the highest wildlife detection rates. This suggests that the current anti-poaching strategies are effective where implemented, but additional resources are needed to extend this system parkwide. Our results also suggest that a decline in patrolling could be detrimental to local wildlife diversity and abundance. Our research underscores the critical role of anti-poaching efforts in conservation strategies and calls for augmented resources to expand these initiatives for broader wildlife protection.



Matthew H Snider

Beyond the frame: Understanding temporal behavior responses of chacma baboons to predation events

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Presenter: Nicholas van Rooyen, vanrooyennicholas@gmail.com

Abstract: Understanding how prey species respond to the risk of predation, plays a fundamental role in our understanding of ecological relationships in the wild. Predation acts as driving force that develops animal behaviors and survival strategies, which drives evolutionary change shaping both the predator and the prey species fitness. This study aims to uncover the mysteries surrounding the behavioural responses of non-human primates to the risk of predation, with a primary focus on (*Papio ursinus*) in South Africa. Chacma baboons encounter a variety of predators in their natural environment, including but not limited to lions (*Panthera leo*), leopards (*Panthera pardus*), spotted hyenas (*Crocuta crocuta*), and wild dog (*Lycaon pictus*). While recorded predation attempts are infrequent, the presence of these large carnivores has behavioral impacts on chacma baboon troops. This research aims to investigate how chacma baboons use temporal avoidance in response to the presence of these predator species across two South African parks using camera traps, as the method of data collection. Our analysis reveals statistically significant relationships between declines in chacma baboon occurrences and the presence of lion and hyena. These results suggest an active temporal behavioural response by chacma baboons to avoid certain areas following a species-specific predator event, to reduce the possible risk of predation. The findings of this study help highlight the complex ecological behaviour of chacma baboon and emphasize the need for further research into this area. Additionally, the findings demonstrate that camera trap data could serve as a promising tool for future studies on predator-prey interactions. However, it is important to note that these results will require further analysis and validation across more sites within the South Africa.



Lessons learned from translocating elephants: A case study in Kasungu National Park, Malawi

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Presenter: Ryan Huang, ryan@ryanmhuang.com

Abstract: In response to concerns over the long-term population viability of elephants in Kasungu National Park in Malawi, over 250 elephants were translocated in 2022 from the nearby population in Liwonde National Park as part of a demographic rescue operation. Often, evaluating translocation success stops with how many elephants arrived safely at their new destination. Post-intervention effects are usually unknown, such as how individuals explore new habitats, interact with residents, and how they may structure themselves spatially and socially in their new habitat. Over the past two years, we have monitored the movements of translocated individuals using satellite telemetry collars and compared their behaviours and space use to those of tracked resident individuals. Elephants frequently leave the park boundaries and raid crops of the nearby communities, leading to increased human-wildlife conflict. Here, we present an overview of how elephants behave after translocation, drivers of conflict, and our ongoing efforts to mitigate such conflict by creating an early-warning detection system to warn communities of elephant movements outside the park. Our work in Kasungu is part of a long-term monitoring program to understand the consequences of translocation to assist dispersal, where natural dispersal may not be a management option.



Ryan Huang

De-incentivising elephant: Tree Wrapping: “Series 1, Episode 2”

Annelize Steyn¹

¹Ecologist Lion Sands Game Reserve

Presenter: Annelize Steyn, ecologist@lionsands.com

Abstract: Elephant has shown a noticeable increase in the targeting of specific large trees in recent years on several farms in Sabie Sand Nature Reserve. Large trees provide nutrient islands or hotspots throughout the landscape; they are a valuable food source for many animals; they have aesthetic as well as iconic value; provide a micro habitat, and a home for many smaller birds and animals.

Focussing on the protection of large trees bears ecological importance, as they are fruit and seed bearing which can in turn be distributed to other areas through natural processes. In the absence of any elephant number reduction actions, several private landowners within SSNR decided to rather focus on protecting the trees themselves. After considering various available methods, wrapping wire netting around the trunk of a tree was the method of attack. This landowner uses community contractors for the wrapping and mapping localities using GIS technology. This method can be beneficial ecologically as well as commercially, based on cost incurred, little impact, and requiring little maintenance, and has little visual impact. It is therefore used to reduce elephant impact in perceived “problem areas and species”.

Results from trees wrapped in 2023: Results and lessons from the first 2 years and 4 000 fenced trees later, indicates... *Data collection is still in progress, results will be available later and added to the abstract. Only x number of trees (8.3% of all wrapped trees) showed any sign of elephant tampering. The wire was tested, tusked, inspected but mostly left intact, with only xx trees showing damaged wire to lesser or greater effect. A total of xx trees were damaged (with or without tampering of the wire). Pushed down trees effected a structural change as foliage was lowered for other species to reach. Only xx trees were totally uprooted and will die eventually.*



Annelize Steyn

The application of scat detection dogs to monitor a wide-ranging carnivore

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Presenter: Eveline Iikondja, dogs2@cheetah.org

Abstract: Large carnivores, such as the cheetah, are a conservation priority. Yet, effective monitoring is challenging due to their elusive nature, wide-ranging behaviour, and low population densities, often resulting in insufficient detections to infer sound conclusions. Detection dogs offer an effective approach for large carnivore monitoring, particularly in the context of scat sample detection, which provides valuable insights into species biology, health, and diet. Despite their successful application for various species on different continents, their use in southern Africa remains relatively unexplored. We conducted surveys using different sampling strategies in multiple areas in central-east Namibia. These areas varied in terms of cheetah densities, land use types and habitats. We successfully detected cheetah scat in all study areas with the assistance of our detection dog. Incorporating marking sites into the sampling protocol drastically increased detections. The detection dog reliably detected these sites irrespective of their morphology. Scat samples detected independent of marking sites were crucial to confirm cheetah presence in areas where marking sites were rare. We propose different sampling strategies tailored to the characteristics of the study area. In this presentation, we explore the utilization of scat detection dogs for cheetah monitoring, focusing on maximizing the detection of scats while using resources most efficiently.

Modeling Wildlife Corridors and Their Implications For Human-Elephant Coexistence In Shared Landscapes

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Presenter: Grace Malley, gracegmalley@gmail.com

Abstract: Ecological connectivity is critical in providing gene flow, food, water, and favorable habitats to wildlife species populations to ensure their long-term viability. However, in human-dominated spaces, landscape change in the form of destruction and fragmentation of habitat and resulting loss of connectivity occurs with increasing frequency, thereby undermining conservation. This study sought to understand the status of structural connectivity between selected protected areas, and whether it can predict human-elephant conflicts occurrences in Morogoro region in Tanzania. We applied environmental and anthropogenic data as well as least cost and circuit-based connectivity models to analyze structural connectivity between four protected areas (Nyerere, Mikumi and Udzungwa Mountains National Parks, and Wami-Mbiki Wildlife Management Area). Through different combination of approaches, 12 sets of corridors were identified, and using human-elephant conflicts (HEC) data, the best set of corridors was determined. In general, land use/land cover was found to have a strong influence in determining structural connectivity of elephant habitats in the study area. Comparison with HEC data showed close proximity between human presence and elephant corridors, and hence leading to occurrence of HEC. In fact, some villages were within 15% of the least cost path. At a width of 2km, two out of five identified elephant corridors were blocked due to expanding cropland. The study provides critical insights into sustainability of protected areas connectivity and human-wildlife co-existence. It highlights areas that need special attention in land use planning at a landscape level to foster shared landscapes amidst growing challenges.



Good Moms: Dependent-Young and Their Mothers Cope Better than Others With Longer Dry Season In Plains Zebras

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Presenter: Lucie Thel, lucie.mc.thel@gmail.com

Abstract: In large herbivores, the timing of births often matches the seasonal peak of availability of food resources, likely to improve juveniles survival. Some ungulates however breed year-round, even in seasonal environments. To what extent being born during the lean season threatens the survival of the juveniles, and of reproducing females, remains often unknown. This is particularly true in tropical ecosystems where the demographic processes underlying population dynamics are often poorly studied. Here, we answer these questions for plains zebras *Equus quagga* living in Hwange National Park (Zimbabwe), a highly seasonal savanna ecosystem. We used capture-recapture models to analyse long-term demographic data collected between 2008 and 2019. We investigated the effect of the seasonality as a categorical (wet versus dry season) and continuous (duration of the dry season) variable on the survival of young individuals and reproducing or non-reproducing females. We found a constant survival of younger foals, whereas older foals and yearlings' survival, which was higher than the one of younger ones, decreased with an increasing exposure to the dry season. Female survival was high but decreased with an increasing exposure to the dry season when females were non reproductive. Our results highlight the importance of individual quality in reproductive performance, as females entering reproduction seems to be able to buffer the effect of environmental variability on their survival and the one of their dependant young. The timing of birth in this population might be the result of a trade off between minimising mother's reproductive costs and maximising juvenile survival.



Diet Of African Wild Cats In The Unprotected Southern Kalahari

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Presenter: Dan Parker, Daniel.parker@ump.ac.za

Abstract: The African wildcat (*Felis lybica cafra*) is the most widely distributed of all wildcat species, and the southern Kalahari in the Northern Cape of South Africa supports high wildcat densities. Anecdotal evidence from livestock farmers in the region suggests that wildcats are capable of preying on sheep (*Ovis aries*) lambs outside protected areas in the region. We investigated the diet of wildcats on livestock farms in the southern Kalahari using stomach content analysis from 117 individuals between 2013 and 2017. On average, 2.5 food items were observed per wildcat stomach. Mammals (90%), reptiles (29%) and birds (27%) were the most frequently recorded food items in the analysed wildcat stomachs. Of the mammals consumed, rodent species (~67%) dominated. Sheep were consumed but in relatively low proportions (~10%) during the study period. The proportions of the mammal species consumed by wildcats varied significantly between 2013 and 2017 and these changes appeared to be driven by variations in the proportions of the rodents that were consumed. Wildcats outside protected areas in the southern Kalahari likely consume sheep opportunistically and this consumption may be influenced by changes in availability of their seemingly preferred rodent prey. We suggest that more detailed assessments of food availability and wildcat diet be conducted to further unpack the extent of human-wildcat conflict in this arid ecosystem.

Understanding the influence of primary production on ungulate birth phenology across aridity gradients in South Africa.

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Presenter: Hermanus Swanepoel, s215282833@mandela.ac.za

Abstract: Phenology, a key area in plant and animal ecology, has garnered significant attention, particularly regarding the reproductive phenology of animals. It focuses on understanding the timing of crucial life events such as birth and conception, in response to environmental cues. This correlation directly impacts ungulate populations, as they rely on seasonal nutrient availability for reproduction and conception. This study delves into the relationship between primary production and the phenology of African ungulates across aridity gradients in South Africa. We investigate how variations in rainfall influence the timing of life history events, such as reproduction and conception, in eight ungulate species: springbok, impala, kudu, eland, blue wildebeest, red hartebeest, gemsbok, and buffalo. Using data from the Snapshot Safari South Africa grid equipped with camera traps and employing NDVI and NDGI indices, we aim to explain the relationship between the onset of primary plant production, ungulate body condition, and the timing, synchrony, and rhythmicity of ungulate birth phenology. Our findings reveal a strong positive correlation between NDVI and NDGI in regions with higher average annual rainfall, whereas areas with lower rainfall exhibit a weaker positive correlation. Furthermore, we observe disparities in the onset of primary production across rainfall gradients and between NDVI and NDGI measures. Notably, fluctuations in body condition mirror the patterns of primary production, with species in higher rainfall regions exhibiting more pronounced fluctuations compared to those in lower rainfall regions. Our findings contribute valuable insights into the complex dynamics between primary production and ungulate birth phenology across diverse rainfall gradients. Understanding these relationships is essential for assessing the capacity of ungulates to adapt to climate change and for informing conservation strategies aimed at safeguarding these species in the face of environmental challenges.

At home or passing through? A citizen science survey of cheetahs & leopards in Etosha National Park

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Presenter: Mburaje Keja, etosha.cesus@orc.eco

Abstract: Accurately estimating species population sizes and distributions is essential in wildlife conservation and management, particularly for keystone species such as large carnivores. These species play a pivotal role in ecosystems due to their position at the top of the food chain. Furthermore, understanding carnivore ecology, behaviour, and population dynamics within protected areas is crucial to conservation efforts and enhances our ability to mitigate conflicts with human populations residing nearby.

This master's project aims to produce the first ever population size estimates and spatial distributions for cheetahs and leopards in Etosha National Park, Namibia. Both species have unique coat patterns, allowing for individual identification from direct observation. Using photographs of cheetahs (*Acinonyx jubatus*) and leopards (*Panthera pardus*) submitted by citizen scientists visiting Etosha National Park from 2024 to 2025, we will use a specialised Artificial Intelligence (AI) platform (i.e. the African Carnivore Wildbook) to aid in identifying individuals. The data will be analysed within a Spatially explicit capture-mark recapture framework to generate population estimates and confidence intervals.

The principal output of this project will be providing up-to-date population size estimates for cheetahs and leopards in Etosha National Park, a priority expressed by the Etosha Ecological Institute and the Ministry of Environment, Forestry and Tourism. This research will contribute to the management of Etosha National Park by providing essential data to inform conservation strategies, ensuring the long-term sustainability of these keystone species and their ecosystems.

Effects of bush encroachment on habitat selection of collared cheetahs in the central plateau of Namibia

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Presenter: Utarera Katjavivi, utarerakatjavivi@gmail.com/utaa@cheetah.org

Abstract: One of the significant changes to the land cover in semi-arid rangelands is bush encroachment. The phenomenon can degrade the land or alter habitat structure, potentially causing habitat loss, fragmentation, and other ecological consequences. This is concerning considering some keystone species such as apex predators rely heavily on favourable environmental conditions for hunting success. For example, cheetahs (*Acinonyx jubatus*) require open grasslands for high-speed hunting pursued. When habitat change through bush encroachment cheetahs may need to cover great distance for preferred habitat types. This results more risk from hypogenic factors due to encountering livestock, crossing roads and private lands when searching habitat and associated prey. I will use historical and current remote sensing data to relate landscape dynamics, particularly bush encroachment to detail cheetah movement data from satellite GPS collar along the 10-year period in the central plateau of Namibia. I will quantify and map woody plant encroachment, and home range variability, habitat selection and movement rate dynamics of cheetahs in response to shifts in landscape conditions. I will also project the response of cheetahs to habitat alterations under different scenario of bush encroachment in the future. The results are likely to demonstrate that the intensity of wood plant encroachment has been increasing, leading to a decline in the presence of localized and healthy habitats for cheetahs. This research will encourage better collaboration among stakeholders to understand and plan for spatially informed landscape management that incorporates habitat requirements and preferences of essential apex predators.



Utarera Katjavivi

Spotted hyaena (*Crocuta crocuta*) recolonisation: Documenting a naturally recolonized spotted hyaena population in Welgevonden Game Reserve.

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Presenter: Muhluri A Maluleke, armstrong@welgevonden.org

Abstract: Before 2014 spotted hyaenas were not present on Welgevonden Game Reserve, Limpopo. However, from 2014 sporadic sightings have occurred becoming more frequent with observed denning, indicating residency. Here we attempt to document this natural recolonisation using 10 years of existing camera trapping data from the Panthera leopard (*Panthera pardus*) monitoring project. Individual spotted hyaenas were identified by applying machine learning and computer vision in the African Carnivore Wild Book platform. We documented 10 years of spotted hyaena recolonisation and we noted an increasing frequency of capture spotted hyaenas using camera traps as follows 2014, 6 photos; 2015, 50; 2016,33; 2017,110; 2018,164; 2019,131; 2020,267; 2021,174; 2022,250; and 2023, 417. The natural recolonization of spotted hyenas is poorly understood and managing spotted hyenas in fenced reserves through reintroductions is poorly described. This will add to our limited knowledge of reintroduction biology for the species and aid in supporting managed metapopulations in the future.



Muhluri A Maluleke

Unraveling the dynamics of urban caracals: Population viability under limited ecological connectivity

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Presenter: Jacqueline Bishop, jacqueline.bishop@uct.ac.za

Abstract: Despite human activities challenging wildlife and disrupting ecological connectivity, human-modified habitats can paradoxically provide resources, enabling ecological persistence and even success for some generalist species. Given that only ~9% of South Africa comprises its protected area estate, effective management of wildlife across apparently sub-optimal habitats is vital for ensuring fine-scale connectivity and broader ecosystem function. Here we examine the habitat selection responses and genomic consequences of urbanization in Cape Town's caracal population. While analysis of GPS collar data reveals modified spatial and behavioural ecologies by caracal in this landscape, comparative genomic data reveals elevated inbreeding via low migration rates over the past 50-75 years. Eco-evolutionary simulations project population decline under current levels of connectivity, with greatly elevated extinction risk under scenarios of reduced migration and increased anthropogenic mortality. While our findings underscore the high behavioural flexibility of caracals in adapting to anthropogenic disturbances within their habitat context, rapid urban development with minimal attention to ensuring connectivity with surrounding landscapes leaves Cape Town's rich biodiversity vulnerable to the adverse effects of ecological isolation.



Jacqueline Bishop

Anthropogenic and ecological drivers of African lion resource selection in Etosha National Park, Namibia

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Presenter: Brennan PetersonWood - Brennan.PetersonWood@uga.edu

Abstract: Understanding the drivers behind resource selection of apex predators, such as African lions (*Panthera leo*), is vital for conservation efforts. Large carnivores are especially vulnerable to anthropogenic pressures, which are becoming more prevalent in areas of Sub-Saharan Africa. As wildlife-based tourism increases and fluctuating climate continues to modify landscapes, it is crucial to better understand lion resource selection to inform conservation strategies. In this study, we utilized GPS collar data from 44 lions tracked between 2016 and 2024 in Etosha National Park (ENP), Namibia to determine how roads, waterholes, and vegetation influence lion resource selection between seasons (wet and dry) using step selection functions. Our results show that within ENP, lion resource selection is more influenced by environmental attributes than anthropogenic factors related to tourism activity. During the dry season, lions selected for areas with more vegetation (grass cover, NDVI, shrub biomass, and tree density), near heavily trafficked main roads, and near dark waterholes away from camps. During the wet season, lions selected for areas with more vegetation (grass cover and NDVI), near roads used less frequently, and near lit waterholes at camps. Typically, lions selected for areas with different vegetation types at night compared to the day, with little variation between seasons. While environmental drivers play a stronger role in resource selection for lions, it is important to note their changes in road and waterhole use based on tourism presence. As such, these results contribute to our understanding of lion resource selection in protected areas with high tourism activity.

Clarifying the effects of moonlight on lion activity patterns

John Heydinger^{1,2}

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Presenter: John Heydinger, heydingerj@gmail.com

Abstract: Many large-bodied carnivores are primarily nocturnal. Better understanding nocturnal chronobiology can therefore contribute to questions related to species' behaviour, ranging and activity patterns, inter-specific interactions, predation, and even conservation interventions. However, where standardized approaches are lacking, research findings are liable to be mis-characterized. In recent years, biologists studying African lions (*Panthera leo*) have undertaken numerous studies assessing lion nocturnal behaviour, with particular emphasis on hunting success and activity patterns as it relates to available nocturnal illumination (moonlight). Consensus is emerging that lions enjoy increased hunting success during periods when moonlight is limited or absent; conclusions surrounding lion nighttime activity patterns are more ambivalent. However, how moonlight is measured has been inconsistent across studies. This paper presents an overview of how different measurements of nocturnal illumination have led to differing characterizations in lions' nocturnal behaviour. Dissimilarities are revealed through contrasting moonlight measurements, taken from published literature, applied to a series of GPS/satellite collars deployed across Etosha National Park and the surrounding landscape. Based upon the findings of this methodological experiment, standardized definitions for examining lion nocturnal activity patterns are presented. It is hoped that standardizing these methodological approaches will contribute to greater research clarity and subsequent improvements in monitoring and lion conservation efforts.