Human-Carnivore Co-adaptation

Exploring changing behaviours, perceptions and (research) practices

Abstracts

Cluster 1: Urban carnivore cultures and disease interactions

"They are part of us": A culture of co-existence among people and spotted hyenas in Harar, Ethiopia

Dr. Markus Baynes-Rock, Alfred Deakin Institute, Australia

Throughout their evolutionary history, spotted hyenas have adapted to a broad range of environments. This is in no small part due to their behavioural flexibility, intelligence, hyper sociality and sheer physical resilience. In contemporary Africa, spotted hyenas are constantly adapting to novel challenges as human populations ratchet up pressure on hyena habitat. In this context, the city of Harar in Ethiopia presents an interesting case-study as an urban environment in which hyenas have been able to thrive. Here, feeding regimes, clan sizes, breeding strategies, and territories are all adapted to the unique context that Harar presents. Moreover, the human population of Harar has adapted to the presence of hyenas, creating a relationship that is unique in Africa. What has emerged is a culture of non-violence that is specific to the town. This paper explores some of the factors that contribute to that culture and what me might learn from Harar's hyenas.

From the shadows to the spotlight: How social media drives human-caracal coexistence in Cape Town

Dr. Gabriella R. M. Leighton[1], Dr. Laurel E. K. Serieys[1,2] & Dr. Jacqueline M. Bishop[1]

[1] *Institute for Communities and Wildlife in Africa*, *Department of Biological Sciences, University of Cape Town, Rondebosch, Cape Town 7701, South Africa*

[2]*Cape Leopard Trust, Cape Town, South Africa*

Carnivores are paradoxically seen as both threats and icons of the natural world. While large carnivores are often central to conservation efforts, they are frequently the first to be extirpated from human-dominated landscapes. As urban areas expand worldwide, smaller,

adaptable carnivores like the caracal (*Caracal caracal*) present new possibilities as flagship species for conservation. The Urban Caracal Project (UCP) was initiated to study the ecology of caracals at Cape Town's urban edges and has revealed that these wild cats, pre-adapted with generalist diets and flexible behaviours, can persist in challenging, rapidly developing landscapes by habituating and selectively using vegetative cover near urban boundaries to avoid human detection. Public engagement with the UCP has been substantial, especially through social media, which has attracted >24,400 followers across platforms and provided an unanticipated means for participatory science. This online footprint has facilitated public contributions, from reporting sightings to aiding in sample collection. Social media has been a launchpad for other forms of media engagement, enhancing the project's scientific and outreach reputation. Positive public perceptions, seen through comments and sightings reports, suggest that Cape Town's residents are increasingly open to coexistence with this charismatic species, despite its reputation as a pest species elsewhere in the country. Moreover, the appeal of caracals online reflects the phenomenon of 'cats on the internet', engaging the public by resonating with familiar, domestic cat aesthetics. These findings highlight the potential of adaptable carnivores as effective flagship species for conservation in urban areas. By leveraging public interest in these smaller carnivores, conservation efforts can bridge the gap between science and society, fostering coexistence and supporting urban wildlife resilience. The UCP's success suggests that as smaller carnivores become focal points of urban ecology projects, they can shift perceptions and encourage sustainable co-adaptation between humans and wildlife in cities worldwide.

Predator disease dynamics and illegal trafficking trends

Prof. Kathleen Alexander, Department of Fish and Wildlife Conservation, Virginia Polytechnic Institute and State University; board president and co-founder of Centre for African Resources: Animals, Communities and Land Use (CARACAL), Kasane,

(Abstract will be submitted before workshop)

Cluster 2: Co-adaptation through the lens of behaviour and technology

Dynamic Behaviors, Dynamic Landscapes: Flexibility and Adaptation in Lion (*Panthera leo*) Behavior

Dr. Natalia Borrego (Max Planck Institute of Animal Behaviour), Dr. Gen Finerty (Leopard Ecology and Conservation)

As apex predators, lions (*Panthera leo*) play a critical role in ecosystems, yet they must navigate dynamic and increasingly human-dominated landscapes. Their behavior, which is neither static nor uniformly predictable, complicates efforts to understand and manage their responses to diverse and changing conditions. My research explores behavioral plasticity in lions, examining how their flexibility, combined with environmental variability, leads to adaptations that manifest differently across systems and landscapes. While this flexibility can, in some cases, buffer against anthropogenic threats, our limited understanding of how and why their behavior varies across conditions makes it difficult to predict their responses, complicating coexistence and conservation efforts. In this talk, I will discuss how my research integrates ethological studies conducted in captivity and in the wild to investigate both ultimate and proximate drivers of lion behavior. Understanding these drivers is essential to informing coexistence strategies and predicting how lions may respond to human-induced changes.

To achieve my research aims, my collaborators and I employ a variety of methods across multiple sites that encompass a range of ecological contexts and environmental pressures. For example, in close collaboration with Leopard Ecology and Conservation (LEC) in Botswana, I combine innovative approaches such as integrating remote sensing techniques with the skills of expert, local trackers to gain insights into the drivers of lion behavior in semi-arid environments. This research incorporates collaborations with local communities, including capacity-building initiatives, to enhance our understanding of lion behavior. By emphasizing capacity building and the involvement of local communities, I will also discuss the importance of participatory research in fostering inclusivity while advancing scientific knowledge. Together, these efforts enhance our understanding of lion behavior and can inform the development of strategies for addressing challenges in shared landscapes.

Livestock farmers' behaviours towards livestock protection and influence on human-carnivore conflicts in Sheya shUushona Conservancy, Namibia

Jona Heita, Department of Wildlife Management and Tourism Studies, University of Namibia

Human-wildlife conflicts are among environmental challenges facing wildlife conservation and sustainable development programs in communities living near protected areas worldwide. Human-wildlife conflicts contribute towards declining populations of large carnivores in the African continent. Appropriate human behaviours towards livestock protection could minimize human-wildlife conflicts (Nicholson et al., 2023; Dickman, 2010). Nevertheless, people's behaviours in human-wildlife interactions are shaped by various socio-ecological factors that are necessary to understand to promote co-adaptation between human and wildlife species. This study adopted the Dickman (2010) conceptual framework to understand how the livestock farmers' behaviours towards livestock protection influenced human-carnivore conflicts in Sheya shUushona Conservancy. It used a qualitative research design to collect data using in-depth interviews and focus group discussions, in addition to secondary data sources. Furthermore, the study used purposive sampling method to select the participants. Findings of the study reveal that the livestock farmers expressed positive and negative behaviours. They used different livestock protection methods that varied in their effectiveness to reduce human-carnivore conflicts. Furthermore, the study has also shown that predators' changing behaviours, such as habituation to mitigation methods, increased livestock depredation in the Conservancy. This study concluded that the livestock farmers' changing behaviours towards livestock protection influenced human-carnivore conflicts. It provides evidence that human-carnivore conflicts should not be viewed homogenously across the affected local communities. Efforts to address human-carnivore conflicts should take into account the various factors shaping human behaviours in specific local communities.

Leveraging Acoustic Monitoring to Foster Human-Carnivore Coexistence

Thato Mutumba, MPhil student, Okavango Research Institute, University of Botswana

Understanding how carnivores adapt to the presence of humans is key to human-carnivore coexistence. Acoustic monitoring may provide insights into the adaptation of carnivores to humans. Acoustic monitoring uses devices that continuously record in the field. Machine learning can then be used to detect species-specific calls. This can be useful for monitoring carnivores that are dangerous or elusive, making direct observation difficult. My research project in Central Tuli, Botswana aims to study the effectiveness of acoustic monitoring for studying leopards and spotted hyenas. The research will compare data from acoustic monitoring to data from camera traps to determine which is more effective at identifying individual leopards and spotted hyenas. The results of this research may provide insights into the effectiveness of acoustic monitoring for studying other carnivore species.

During the workshop, I plan to talk about how understanding carnivore behaviour through acoustic monitoring may help to mitigate human-carnivore conflict and promote coexistence. Leveraging acoustic monitoring is essential for the following reasons:

- Provides insights into carnivore movement and habitat use, allowing for better land management practices to minimize human-carnivore encounters.
- Detects changes in carnivore behaviour in response to human activities, such as changes in vocalization patterns.
- Helps to identify individual carnivores, which can aid in tracking their movements and understanding their behaviour.
- Provides information that can be used to educate local communities about carnivore behaviour and the importance of coexistence.

Cluster 3: Shaping co-adaptation for co-existence. Insights from the field

Technology and Tradition: Using a holistic approach for human wildlife co-adaptation

Dr. Andrew Stein, Virginia Pelayo M.Sc., Gobopaone Senatla M.Sc., Mathata Tomeletso, Christopher Dimbindo and Dr. Edwin Mudongo (CLAWS Conservancy)

Human-Wildlife Conflict (HWC) is a complex issue that requires a holistic approach. In 2013, farmers of the northern Okavango Delta, Botswana used poison (carbofuran) in retaliation for livestock losses to lions. The result was the loss of approximately 50% of the known lions in that single year and scores of dead Endangered vultures. In response, CLAWS Conservancy took a compassionate approach to dissuade farmers from using poison through technology and traditional practices. In 2019, CLAWS fitted potential conflict lions with GPS collars. Using these collars, CLAWS established a first-of-its-kind Lion Alert System that disperses automated real-time warnings when lions breach a geofence of 3km radius around cattle posts or 5km around villages. In five years, CLAWS has signed up over 370 farmers to receive alerts and dispersed over 40,000 alerts. Though most farmers feel alerts are beneficial, many do not take preventative action and losses continue. At the request of farmers, CLAWS initiated a Lion Response Team that intercepts lions and uses deterrents that encourage lions to retreat 6km on average (n = 25). Additionally, CLAWS implemented Herding 4 Health, an adapted system of livestock husbandry that incorporates traditional practices. Since 2019, CLAWS has established three herds in two villages with nearly 600 cattle. These managed herds have had no losses to predators in over two years and receive premium pricing for their certified Wildlife Friendly Beef. Lion populations have recovered and grown since 2013 with no lions killed in over two years and no lions poisoned in five years.

"Navigating Conflict and Conservation: 24 Years of Leopard and Lion Ecology in Botswana's Central Kalahari"

Alessandro Araldi, Leopard Ecology and Conservation

Since 2000, Leopard Ecology & Conservation (LEC) has studied leopard and lion populations in Botswana's Khutse Game Reserve, the southern Central Kalahari Game Reserve (CKGR), and adjacent grazing lands. This long-term research has identified complex factors potentially influencing predator behavior, including climate change, expansion of cattle posts, absence of buffer zones, reduced prey availability, partial fencing, ecological pressures from a rising elephant population, and increased bushmeat poaching—challenges that threaten the fragile balance in this ecosystem. Over 24 years, LEC has collaborated with local farmers, Botswana institutions, and international researchers to document livestock predation trends, post-release behaviors of translocated leopards, and large felid movement patterns, yielding valuable insights into how Kalahari predators adapt to rapid resource loss. Nevertheless, despite technological monitoring advances and strong community relationships, a significant gap persists in effectively implementing preventive and reactive conflict mitigation measures. This presentation offers a qualitative overview of human-carnivore interactions along Botswana's southern CKGR border, exploring current challenges and projecting potential outcomes based on observed trends.

Land Use Conflict Identification Strategy and Holistic Livestock Management Model Implementation towards Human Carnivore Coadaptation; The Case of Chobe District Botswana.

Kedi Selume, Wayne Katse, WildCat Botswana Trust

The coexistence of humans and carnivores presents both challenges and opportunities for sustainable development. The Chobe region, renowned for its biodiversity and tourism potential, faces challenges related to land use planning and conflicts, conservation, and community livelihoods. Incidents of human carnivore conflict mostly predation cases are realised in varying occurrences according to the different seasons each year and this has potential to antagonize communities against co-adaptation and coexistence.
The presentation demonstrates how the Land Use Conflict Identification Strategy (LUCIS) can be employed to mitigate the conflicts between different land use pressures, and secure important conservation outcomes meanwhile promoting human wildlife co-adaptation. It further highlights the Holistic Livestock Management Model as a livelihood model aimed at promoting change in the existing livestock farming systems that arguably contributes to increasing human-carnivore conflicts. The loss of traditional livestock management practices, such as herding and kraaling, has contributed to depredation and degradation of rangelands.

The "Holistic Livestock Management Model Herding", designed to enhance change of behaviour and perceptions of pastoral communities while simultaneously promoting the conservation of local carnivore populations. By integrating traditional herding practices with innovative strategies informed by community engagement, the model seeks to transform perceptions and behaviors towards carnivores, mitigating human-wildlife conflict. The presentation will explore the multifaceted impacts of the Herding Model, examining shifts in community attitudes, behavioral adaptations, and practical outcomes. By promoting a symbiotic relationship between humans and carnivores, we envision a sustainable future for both communities and wildlife in the Chobe Enclave.

Effectiveness of community-based livestock protection strategies in mitigating conflict between livestock farmers and lions

Dr. Lovemore Sibanda, Paul Johnson, Esther van der Meer, Courtney Hughes, Bongani Dlodlo, Liomba Mathe, Jane Hunt, Roger Parry, David Macdonald, Andrew J. Loveridge

Conservation scientists increasingly recognise the need to evaluate the effectiveness of interventions to improve human-wildlife coexistence across different contexts. We assessed the long-term efficacy of the Long Shields Community Guardians programme in Zimbabwe. This community-based programme seeks to protect livestock and prevent depredation by lions (*Panthera leo)* through non-lethal means, aiming to promote human-lion coexistence. Using a quasi-experimental approach, we measured temporal trends in livestock depredation by lions and the prevalence of retaliatory killing of lions by farmers and wildlife managers. Farmers that were part of the Long Shields programme experienced a significant reduction in livestock loss to lions, and the annual number of lions subject to retaliatory killing by farmers dropped by 41% since the start of the programme in 2013, compared to 2008–2012, before the programme was initiated. Our findings demonstrate the Long Shields model has been an effective tool for limiting livestock depredation by lions. Our presentation will demonstrate the effectiveness of community-based interventions in reducing human-lion conflict.

Cluster 4: Historical and changing carnivore-human relations

The War of Lions. Lion-human entanglements in northern Mozambique, 2002-2003

Prof. Paolo Israel, Department of Historical Studies, University of the Western Cape

Between 2002 and 2003, the district of Muidumbe, in the far north of Mozambique, bordering Tanzania, underwent a dramatic crisis. In less than a year, lions devoured about sixty people,

first in remote agricultural areas, then in the heart of the communal villages established at the heyday of socialism. Following the account of some survivors, who described the attacks as having been perpetrated by knife-wearing men masquerading as lions, fear and suspicion spread in the district. Suspected sorcerers deemed able to transmogrify into lions were lynched by mobs of youths. Healers protested against the government for disregarding their knowledge and advice. Hunters put down their weapons. Rumours ran rampant of a secret society of lion-men trafficking human organs in collusion with the local administration. Eventually, this crisis escalated into a youth uprising against the local government.

These events, which I witnessed first hand, are the object of a forthcoming book, *The War of Lions: A witch-hunt in the heartland of the Mozambican revolution*, an ethnography written as creative nonfiction (Chicago: HAU Books, 2025). The crisis described in the book was unprecedented both at a political and at an ecological level: on the one hand, marking the unravelling of a socialist mode of life; and on the other, resulting from the last stand of a pride of lions in a context of habitat erosion and human encroachment.

My presentation will discuss the events as a striking – if tragic – case of human-lion coadaptation. The presentation will focus on two aspects. First, it will discuss changing conceptions of human transformation into animal, in which lions feature prominently as symbols of the ambivalence and elusiveness of magic power. Secondly, based on the evidence gathered during fieldwork, but also on a reading of colonial literature, the presentation will analyse the behaviour of man-eating lions, cunning and unpredictable, embedded in a regional animal culture. The point of contact between the historical developments of these two cultural idioms lays in the massive transformations wrought by slavery, colonialism and capitalism on the environment in general and the human-animal nexus in particular.

Landscapes of fear in change: Past and contemporary human-lion co-adaptation in the northern Okavango Delta

Julia Brekl, University of Cologne

Coexistence has emerged as a key concept in managing and understanding human-carnivore interactions. However, the term is interpreted in various ways, which, while allowing for broad applicability, can also complicate its management on the ground. A prevailing notion is still that coexistence represents a future goal. However, different forms of coexistence between humans and carnivores have existed for millennia, often alongside conflicts. Following Carter and Linnell's (2016) suggestion to explore "co-adaptation" as a means to understand and facilitate coexistence, this presentation will focus on the mutual co-adaptation process between people and lions in the eastern panhandle of the Okavango Delta, Botswana. Livestock, humans and lions have interacted here for centuries, today in demarcated communal grazing land adjacent to Wildlife Management Areas. For humans and non-humans those areas have been experienced as landscapes of fear on different dimensions. Drawing from ethnographic and archival research, as well as insights from the natural sciences, I will

present both past and contemporary strategies of local human adaptations to predator presence ranging from lethal management, (reintroduction of) herding, algorithm warning systems, spiritual control to meat sharing, shaped by various political, social, and environmental factors. In this context, I will also highlight the role of human-human conflict in the co-adaptation process involving questions of power, responsibility and ownership which can hinder effective adaptation. Based on local accounts, I will trace how specific local lion cultures emerged in response to human interactions. I argue that contemporary coexistence and co-adaptation must be understood within their historical and cultural context paving the way for a holistic and equitable approach in management efforts.