Mpala Newsletter

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Celebrating PIAF fellow Eugenia Chow's farewell at Mpala Research Centre

Letter from the Mpala Team

Dear Mpala Community,

August marked the end of the summer rush, yet the Centre remained as vibrant and tight-knit as ever, with researchers making the most of their last few sundowners of the season.

This month, we hosted our quarterly webinar in partnership with the National Museums of Kenya (NMK). We were honoured to welcome Prof. Mary Gikungu, the Director General of NMK, as our keynote speaker. She was joined by Dr. Talta Terer, Director of the Directorate of National Repository and Research (DNRR), and Dr Emmanual Ndiema, Head of the Earth Sciences Department. Mpala Researchers Prof. Damien Farine, Annabella Helman and Alice Burton also shared their findings. We are grateful to all who joined us, and helped enrich a powerful conversation on capacity building, and scientific advancement in Kenya.

We also warmly congratulate Dr. Finote Gijsman, who successfully defended her dissertation at Princeton University. Dr. Gijsman conducted her research on dung beetles at Mpala under the UHURU project supervised by PI Rob Pringle.

Our Communications team took part in the 2nd annual Inclusive Conservation Summit, hosted by Impact Kenya, the Inclusive Conservation Initiative, Conservation International and IUCN. These important dialogues on the inclusion of Indigenous Peoples and Local Communities (IPCL) in conservation initiatives in the Mid-River Ewaso Ng'iro landscape continue to guide and inspire our work.

We were thrilled to welcome our new Princeton in Africa fellow, Agata Rigo-Saitta, who will collaborate with Mpala researchers and our science and outreach teams to share Mpala's work with local communities and other stakeholders across the landscape.

August reminded our community to cherish each day spent at Mpala as the busy season begins to dwindle, and we said our farewells to Masters student Sam Kiuna and PIAF fellow Eugenia Chow.

As we look ahead to the new season, we're filled with gratitude for the experiences behind us, and for your continued support.

Warm regards,

The Mpala Team

Featured Research

Vulturine Guineafowl Research Programme

Charlotte Christensen and Brendah Nyaguthii prepare to release two vulturine guineafowl that have just been fitted with tag-backpacks programmed to collect GPS and accelerometer data. Photo courtesy of Charlotte Christensen.

Since 2016, the Vulturine Guineafowl Research Programme has been dedicated to understanding the lives of vulturine guineafowl in their natural habitat. Through a combination of field observations and solar-powered GPS tracking, the team has uncovered key insights into the social structures of the population, how groups use space depending on ecological conditions, and how they make decisions on who to follow.

In 2022, a new layer of data was added to their research with the integration of tri-axial accelerometers—tiny devices that measure movement in three directions. Think of them like a Fitbit for animals, providing detailed activity patterns, from walking and foraging to resting. When combined with GPS data, researchers now know not only where these birds are, but what they're doing there.

A recent paper published in *Animal Behaviour* highlights how machine learning is being used to analyze massive amounts of accelerometer data and classify daily activity budgets for the guineafowl. The team also discusses how the model's accuracy is validated, using real-world tests like tracking increased feeding behavior near experimental food patches. This approach gives researchers confidence that the technology is effectively identifying changes in behavior, providing valuable insights into how these birds interact with their environment.

The applications of accelerometer data are vast. Understanding where and when animals forage or rest could help guide environmental protection efforts. In addition, shifts in animal behavior could signal emerging threats to the ecosystem. Over the next few years, the team plans to use this technology to explore how vulturine guineafowl cope with seasonal and climate-induced stresses, particularly the extended droughts exacerbated by climate change.

Read more about this Project

Faces of Mpala

Featured Researcher: Micah Wangai

Driven by a deep passion for nature, Micah Wangai's research has focused on bridging the gap between human-wildlife interactions and conservation. Growing up near Aberdare National Park in Central Kenya, his early exposure to wildlife documentaries and local human-wildlife conflicts sparked a lifelong interest in wildlife ecology. Now a research assistant on the Vulturine Guineafowl Project at Mpala, Micah studies animal behavior and ecology with a focus on human-wildlife coexistence and the role of conservation in mitigating conflicts.

Read more about Micah

Featured Publications

Moving towards more holistic machine learning-based approaches for classification problems in animal studies

Christensen, C., Ferreira, A. C., Cherono, W., Maximiadi, M., Nyaguthii, B., Ogino, M., Herrera, D., Farine, D. R.

Machine learning (ML) is transforming animal behavior studies, but traditional performance metrics may underestimate model effectiveness, especially with noisy data. This study highlights how labeling errors can limit metrics and argues that imperfect models can still support hypothesis testing. Using vulturine guineafowl accelerometer data, we show that biological validation with unlabelled data can confirm model utility. Our results suggest meaningful patterns can be detected even with lower performance scores (F1: 60-70%), offering a new approach for validating ML models in biological research.

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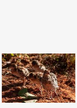

The multilevel society of a small-brained bird

Papageorgiou, D., Christensen, C., Gall, G. E., Klarevas-Irby, J. A., Nyaguthii, B., Cousin, I. D., & Farine, D. R.

Animal societies can be organized in multiple hierarchical tiers, with stable groups moving together and forming complex social structures. In species like hamadryas baboons, smaller units group into clans and larger bands, requiring individuals to track multiple relationships. In this study, we provide evidence for a multilevel society in the small-brained vulturine guineafowl (*Acryllium vulturinum*). Our findings show that these birds live in large, multi-male, multi-female groups that preferentially associate with specific other groups, both during the day and at night-time communal roosts.

Continue reading

Seasonality impacts collective movements in a wild group-living bird.

Papageorgiou, D., Rozen-Rechels, D., Nyaguthii, B., & Farine, D. R.

We studied the collective movement patterns of vulturine guineafowl (*Acryllium vulturinum*) over 22 months using high-resolution GPS tracking. Our findings show that during drier seasons, groups expanded their range, traveled farther, and moved more frequently, resulting in a three-fold increase in the population's area use. In contrast, wetter seasons saw smaller, more regular movements. These shifts in collective behavior highlight how group-living animals adapt to environmental changes like droughts, which may become more frequent under climate change, potentially altering population-level movement patterns.

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Shared decision-making allows subordinates to lead when dominants monopolize resources.

Papageorgiou, D., & Farine, D. R.

The concepts of leadership and dominance are often conflated, with high-ranking individuals assumed to be the decision-makers. However, in species like the vulturine guineafowl (*Acryllium vulturinum*), shared decision-making can reduce conflicts caused by dominance, especially when monopolizing food resources. We show that when dominant individuals displace subordinates from monopolizable food patches, the excluded subordinates initiate collective movement, prompting dominants to follow. In contrast, at nonmonopolizable resources, dominants contribute more to group decisions. Our findings highlight how shared decision-making helps balance influence within animal societies.

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Mpala explores solutions to current and emerging challenges by advancing transformational ecosystems research and teaching, conserving our environment, and partnering with our community.

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Our Partners

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