

ZSL SCIENCE AND CONSERVATION EVENT

Remote sensing for savannah species conservation



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**Tuesday 9 November 2021
6:00pm – 7:30pm UK Time (GMT)**

Online event livestreamed to zsl.org/IOZYouTube

[Direct link: <https://youtu.be/wPatRFRATSc>]

There is no charge for this event, and no need to register in advance

AGENDA

Meyer Etienne de Kock, University of Pretoria, South Africa and Czech University of Life Sciences, Prague

Automated detection and feature extraction of ungulates from UAV imagery

Larissa Slaney, Heriot-Watt University, Edinburgh and Wild Track Specialist Group
Tracking cheetahs – How footprint analysis can help cheetah and wildlife conservation

Dr Karolína Brandlová, Czech University of Life Sciences, Prague and Derbianus Conservation NGO

Mind the stripes! The importance of individual identification for population management

Professor Pavla Hejcmanová, Institute of Zoology, ZSL and Czech University of Life Sciences, Prague

Carrying capacity in ungulate conservation: why to measure and how

ABSTRACTS

Automated detection and feature extraction of ungulates from UAV imagery

Meyer Etienne de Kock, University of Pretoria, South Africa and Czech University of Life Sciences, Prague

In the field of species conservation, the use of Unmanned Aerial Vehicles (UAV's) is increasing in popularity as an observation and monitoring tool. With a relatively large data set created by UAV based mapping the need for the field biologists arises to automate the detection process of the species of interest. Although the use of computer learning algorithms for image object base analysis is an increasing trend, there are Geographical Information Systems (GIS) based software tools available, initially developed to analyse satellite imagery.

UAV based imagery processed through photogrammetry software and georectified datasets opens the door for relatively accurate zoometric measurements of the species of interest, and the development of predictive models. Extracting non-invasive feature data from individual animals using UAV-based imagery focused on large ungulates is a powerful tool for the field biologist responsible for the management of these populations in protected areas; thereby contributing to the overall conservation of the species. The methods described can be adapted for a range of species and customised to extract the features from individuals, of the species of interest.

Meyer Etienne de Kock, Station Manager of the Hans Hoheisen Wildlife Research Station situated in the Greater Kruger National Park, South Africa for the University of Pretoria, is currently in the final stages of his PhD at the Czech University of Life Science (CULS) Prague. His research focuses on the automated detection and feature extraction of large ungulates from Unmanned Aerial Vehicles (UAV) imagery. A large part of the research was done in the Middle East and North Africa arid regions.

Tracking cheetahs – How footprint analysis can help cheetah and wildlife conservation

Larissa Slaney, Heriot-Watt University, Edinburgh and WildTrack Specialist Group

We are experiencing the sixth mass extinction and the cheetah (*Acinonyx jubatus*) is one of many species in decline. Scientists need to collect population data on endangered species to understand the situation better and advise policy makers accordingly. One way to gather data in a non-invasive way is by footprint analysis.

The 'Fit Cheetahs' research project at Heriot-Watt University focuses on the morphometrics of cheetah tracks and seeks to find out if WildTrack's Footprint Identification Technology (FIT) can establish whether two cheetahs are related as well as which sex and subspecies they belong to. Research is currently ongoing, but this presentation shares preliminary results, explains why this research is of importance and how FIT works. It then looks at the opportunities of FIT for wildlife conservation in general and WildTrack's new Artificial Intelligence (AI) project to which the Fit Cheetahs research also contributes. New FIT algorithms are being developed from captive individuals in zoos to help their endangered cousins in the wild. The new AI approach uses state of the art computer vision and has the potential to make a real difference in non-invasive wildlife conservation.

Larissa Slaney is a PhD candidate at [Heriot-Watt University](#) in Edinburgh, UK. Her '[Fit Cheetahs](#)' research focuses on cheetah footprint morphometrics and seeks to establish whether the Footprint Identification Technology (FIT) by [WildTrack](#) can identify related cheetahs and distinguish sex and sub-species. Larissa has been working on various FIT projects since 2017 and is also a founding member of the WildTrack Specialist Group that specialises in footprint analysis and other non-invasive monitoring technologies.

Mind the stripes! The importance of individual identification for population management

Dr Karolína Brandlová, Czech University of Life Sciences, Prague and Derbianus Conservation NGO

Dr Karolína Brandlová has 15 years of field research experience from West African savannah, namely within the Western Derby eland conservation in Senegal. She is chair of the Derbianus Conservation NGO, IUCN SSC Antelope Specialist Group member, Research advisor of Antelope & Giraffid Taxon Advisory Group EAZA, and Coordinator of the Antelope Breeding Committee of Czech and Slovak Zoos. Karolína has further field experience from Benin, South Africa, Namibia, Niger, and Mongolia, and supervises students in Central African Republic, Congo Brazzaville, Democratic Republic of Congo, Namibia, Niger, and Senegal. Her research topics have mostly focused on antelope and giraffe, both in the field and in zoos, oriented on applied research topics with a practical input for informed conservation decision making.

Carrying capacity in ungulate conservation: why to measure and how

Professor Pavla Hejčmanová, Institute of Zoology, ZSL and Czech University of Life Sciences, Prague

Carrying capacity refers to the ability of ecosystems to sustain organisms in the long term. Nowadays, when ecosystems are facing rapid changes of the climate and environment, the carrying capacity may become critical for successful conservation of endangered species. Reliable, science-based estimations of carrying capacity should therefore become an integral part of conservation operations, such as translocations or updating viability assessments for species at specific sites, and related decision-making.

Estimating ecological carrying capacity for non-domesticated herbivores is a difficult task due to the diversity of feeding strategies, which requires diverse approaches. The assessment of browse availability is especially challenging, and ground biomass sampling is always necessary. However, the Unmanned Aerial Vehicle's (UAV's) tools allow us to get a wider view on the environment beyond sampling points on the ground. Furthermore, processed UAV-acquired imagery enables us to acquire data on large areas, and by coupling with ground data to model biomass availability, we can estimate carrying capacity over target areas. The application of this approach using remote sensing tools will be discussed using the case of estimating browsing carrying capacity for West African giraffe in the Gadabedji Biosphere Reserve in Niger.

Pavla Hejčmanová is a Professor at the Faculty of Tropical AgriSciences, Czech University of Life Science (CZU) Prague, and also currently undertaking a Research Fellowship at the Institute of Zoology, ZSL. She is wildlife ecologist and conservationist with a focus on antelopes, herbivore foraging, spatial ecology, and habitat selection, with Derby eland in the West African savannah as her flagship species. She is founding member of Derbianus Conservation NGO and a member of the IUCN SSC Antelope Specialist Group.

Format of Live Events

- This interactive online event will be livestreamed to our YouTube channel here: zsl.org/IOZYouTube. A direct link to the livestream will also be shared on the event web page before the event.
 - Before attending this event, please read our Code of Conduct found [here](#).
 - This event will run from 6:00pm – 7:30pm, and will be available to watch afterwards on our YouTube channel.
 - Each event will comprise of short presentations from experts in the topic, followed by interactive Q&A and panel sessions. Viewers will be encouraged to join the event live and ask questions using an online platform.
 - If you wish to submit a question to a speaker prior to the event, please send it to scientific.events@zsl.org. Please be aware we may not be able to answer all questions.
 - There is no charge for this event, and no need to register in advance.
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ZSL Wild Science Podcast

Listen to previous episodes of our award winning ZSL Wild Science podcast [here](#), produced by Dr Monni Böhm and Eleanor Darbey. Don't forget to **rate** and **review** to help boost us in the charts, and [subscribe](#) on your podcast app so you don't miss any future episodes!

Join our next ZSL Science and Conservation Event

CSI of the Sea: what have we learnt from 30 years of investigating cetacean strandings?

11 January 2022, 6:00pm – 7:30pm

For centuries, cetaceans (whales, dolphins and porpoises) have been found stranded around the UK coastline. But the role of human impacts in causing these events remained unclear until the advent of the collaborative [ZSL-led UK Cetacean Strandings Investigation Programme](#) (CSIP). In the 30-year period since its inception, the CSIP has recorded data on over 17,000 cetacean strandings and investigated over 4,500 through systematic and forensic post-mortem examinations. During this anniversary event we will explore the work of the CSIP in the UK over the last 30 years and discuss what our research reveals about the threats these species face and the state of the wider marine ecosystem.



Further Information

- Please contact the Science Communications and Events Manager, Eleanor Darbey (eleanor.darbey@zsl.org), if you have any queries about our Science events or podcasts.
- For press enquiries, please contact the ZSL Press Office: press.office@zsl.org.
- For more information about how to join the ZSL Fellowship programme and engage with a network of thousands who are shaping the future of conservation, please visit: www.zsl.org/membership/zsl-fellowship.
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To feed and care for our 30,000 animals, many of which are endangered, costs £1million a month and the national lockdown has left us struggling. But with your help we can carry on caring for our amazing animals and continue our global conservation work. Support us today – **Join, visit or donate.**