

ZSL SCIENCE AND CONSERVATION EVENT

Can surveillance technology and social science address rule-breaking and wildlife crime?

Tuesday 10 December 2019

Huxley Lecture Theatre, Zoological Society of London,
Regent's Park, London NW1 4RY

AGENDA

Chaired by Dr Tom Letessier, Institute of Zoology, ZSL

Receive the following communications

Dr Kristina Boerder, Dalhousie University

Tracking global fisheries from space: patterns, problems and promises

Dr Colin Beale, University of York

Using algorithms to improve the efficiency and effectiveness of ranger-based patrols

Professor Serge Wich, Liverpool John Moores University

Infrared technology and drones: opportunities for enforcement and wildlife monitoring

Dr Ana Nuno, University of Exeter

Rule breaking in conservation: social sciences to the rescue!

ABSTRACTS

Tracking global fisheries from space: patterns, problems and promises

Dr Kristina Boerder, Dalhousie University

The oceans and special areas of interest, such as marine protected areas (MPAs), can be monitored with a range of different observation methods - from patrol boats to aerial surveys by drone or plane, to satellite monitoring using radar and imagery, and new vessel tracking systems. Observations from space enable a new, big picture understanding and novel insights into large and even remote areas. Ship tracking, such as vessel monitoring systems (VMS) and automatic identification systems (AIS), have gained much popularity over the last decade and are now widely used to identify ships and observe their activities and behaviour, such as fishing, or the transshipment of fish catch at sea. Drawing on novel research using observations from space, this talk will explore examples and scientific studies how these and other new technologies can be applied to track the movements of ships worldwide and study the complex web of global fisheries and seafood supply chains. From helping to intercept illegal fishing vessels to highlighting conservation gaps in the management of European MPAs, vessel tracking can expand our understanding of the global pathways of ships far beyond the horizon.

Kristina Boerder, originally from Germany, is a postdoctoral fellow at Dalhousie University, Halifax/Canada, working on the interactions of fisheries and marine conservation. She completed her PhD on fishing vessel tracking and marine protected areas with Dr Boris Worm and Global Fishing Watch in 2018. Her further research interests include the role of illegal fishing in seafood supply chains and the conservation of biodiversity on the High Seas. She has worked in marine protected areas worldwide on fisheries management and habitat restoration, and is currently involved with a new initiative to improve data availability for marine spatial planning.

Using algorithms to improve the efficiency and effectiveness of ranger-based patrols

Dr Colin Beale, University of York

Law enforcement in the field is a key focus for tackling wildlife crime, with rangers being the front-line operators in our efforts to protect wildlife. Skilled rangers know where illegal activities occur and may be able to deter wildlife crime before it happens. Increasingly, rangers are equipped with modern GPS technology that not only allows their managers to monitor ranger patrol coverage, but allows rangers to record the locations of illegal activities. We have been developing computer algorithms to use this ranger-based monitoring data to improve the efficiency of ranger patrols and detect more signs of illegal activity. Such artificial intelligence based solutions can complement rangers' own understanding and help identify how to best allocate ranger effort: in Uganda we have seen dramatic improvements in efficiency at detecting snares. In the future we may harness new algorithms to counter threats from law-breakers in real time, assisting rangers to make decisions on which threats to counter and how to do so. However, such tools raise ethical questions and we must be careful about how they are implemented if we are to maintain an equitable and proportionate response to the threats posed by law-breaking in protected areas.

Colin Beale is an ecologist with broad interests in spatial ecology and conservation biology, particularly in Africa. Many of his current research projects are based in Tanzania and range from experimental studies of the fundamentals of savannah ecology through foraging behaviour of vultures to studies of poaching both substance and commercial. He has worked for the conservation NGOs "A Rocha" and the RSPB, but now leads the spatial ecology and conservation biology research group at the University of York, where he is a Reader in Ecology.

Infrared technology and drones: opportunities for enforcement and wildlife monitoring

Professor Serge Wich, Liverpool John Moores University

Land-cover change and hunting are leading to major declines in tropical biodiversity. The fast changes occurring in the tropics place an urgent need on rapid and affordable techniques to monitor wildlife and its habitats. Recently the use of drones in conservation has increased markedly and thermal cameras are becoming more widespread. In this presentation I will provide some examples of the usage of visual spectrum and thermal cameras for the detection of wildlife and poachers. Due to the large amounts of data that are collected there is a need for fast-processing of data. Machine learning is a promising option for such analyses, and I will describe some recent work on machine learning for the processing of visual spectrum and thermal data. I will end with some thoughts on integration on various sensors for nature conservation.

Serge Wich is a biologist who focuses on great apes. He obtained his PhD at Utrecht University and has worked for universities and NGOs in the US, Switzerland, The Netherlands, and Indonesia. Since 2012 he works at Liverpool John Moores University. Serge is also a Founding Director of the non-profit, ConservationDrones. His research focuses on primate behavioural ecology, tropical rain forest ecology and conservation of primates and their habitats. He uses a mixture of observational and experimental fieldwork and is keen to use technology, such as drones for his research and conservation work.

Rule breaking in conservation: social sciences to the rescue!

Dr Ana Nuno, University of Exeter

Many human activities undermining the success of conservation and natural resource management strategies are illegal or otherwise sensitive. Whilst indirect approaches for measuring the extent of illegal resource extraction exist, such techniques tell us little about the characteristics of rules breakers or what drives their behaviour. Tools for social research can then be critical for developing an understanding of rule breaking in conservation and assessing the feasibility of actions to address illegal behaviour. Using a few case studies all over the world, I will illustrate different tools and approaches for assessing rule breaking using social science, and identify challenges and opportunities. Whilst the weaknesses and strengths of different tools must be critically considered, social research insights can provide essential information for addressing rule breaking and should be considered when quantifying illegal activities as well as informing design of interventions (e.g. enforcement and outreach) aimed to reduce them.

Ana Nuno initially trained as a biologist, and quickly decided to specialise in Conservation Science with a focus on applying tools from social sciences. After doing a PhD at Imperial College, she started

working at the University of Exeter, where she currently works as a Research Fellow. For the least 12 years, she's been lucky to learn from researchers, NGOs and local communities all over the world, bringing together all the tools she can to address sustainability challenges. Ana has recently been awarded a Marie Curie Fellowship to focus on social-ecological integration for improved conservation and wellbeing outcomes.

Join us at our next event

Coral reefs: running the gauntlet of climate change

14 January 2020, 6pm – 7:45pm

Coral reefs are the most biodiverse marine ecosystems in the world, and although more than 500 million people directly rely on them, they are under severe threat from climate change and a range of human stressors. Reducing carbon emissions and increasing reef-protection measures are essential to ensure their persistence. Join us to investigate the emergent technologies being developed to help corals survive in these inhospitable conditions, and provide some optimism for the future.



ZSL Library Events

The library will continue their monthly talks at **4:45pm** before each **Science & Conservation Event** this year, each one focusing on different examples from their Special Collections! No need to book, just come along, or find out more here... www.zsl.org/about-us/zsl-library-collection.

ZSL Wild Science Podcast

We will be creating a podcast relating to this event topic, so be sure to keep an ear out for it in the following months! Listen to more of our award winning **ZSL Wild Science podcast** episodes hosted by Research Fellow Dr Monni Bohm here... www.zsl.org/zsl-wild-science-podcast.

Please feel free to contact the Scientific Events Coordinator, Eleanor Darbey (eleanor.darbey@zsl.org), if you have any queries about our events.