ZSL SCIENCE AND CONSERVATION EVENTS

A B S T R A C T S

InstantWILD: a revolution in field conservation

Tuesday 8 April 2014
The Meeting Rooms, The Zoological Society of London, Regent's Park, London NW1 4RY

Chair: Olivia Needham, Zoological Society of London

An Introduction to ZSL's Conservation Technology Unit and InstantWILD
Jamie McCallum, Senior Programme Advisor Edge and Conservation Technology

Through a dedicated Conservation Technology Unit (CTU), the Zoological Society of London (ZSL) is working to develop game-changing technological tools that will exponentially increase the world's ability to respond to conservation threats.
With global biodiversity in rapid decline and a growing number of species on the brink of extinction, technology is becoming ever more important in helping us to collect, process and analyse relevant data at different spatial and temporal scales.
This in turn can better enable us to identify threats, develop mitigation strategies and test their effectiveness. Instant Wild (IW), the CTU's flagship tool, is an advanced remote surveillance system that will revolutionise anti-poaching efforts and wildlife monitoring through real-time data collection and transmission. We will give background on the system, its history and partners and its potential application across a wide range of areas for a variety of uses.

Instant Wild System
Dave Anderson and Jason Sierra from Seven Technologies Group

The Instant Wild System operates by using seismic or magnetic sensor trigger input (Remote Sensors) to provide up to 6km line of sight RF notification to the central node of intrusion into the target area. The Camera Node is triggered to capture an image by an on board PIR sensor, and is in sleep mode until the PIR is triggered to conserve power. The Camera Node has an IR flash array to assist with image capture in low light conditions. It can also be provided with concealments to assist with system deployment. The captured image is sent via RF to the central node, and stored locally on an SD card. The SD card is housed along with the AA battery pack, and is connected to the camera node via a cable of up to 10m.
The Central Node is awake at all times, waiting to be contacted by a Camera Node with images to transfer, or the UGS system to notify intrusion. As images are captured, the Camera Nodes will attempt to contact the central node and upload their new images. System notifications and images are sent from the Central Node via an Iridium link to the

operation room. The Operations Officer can then determine whether to respond to the alert and image.

Long term animal behaviour analysis using camera traps

Dr Krystian Mikolajczyk, Reader in Robot Vision, University of Surrey

In this talk I will present our recent research on developing a system for automated video monitoring of long term behavioural activity for modelling standards of daily activity, and deviations from this standard in a number of animal species. Changes in behavioural patterns can reflect modifications in the internal or external environment (e.g. season or timing of feeding), or may indicate a change in circadian drive caused by welfare or health issues such as inflammation, aging or reproductive state. Comparing on-going behavioural activity against individual diurnal standards' can be a powerful online tool for non-invasive detection of animal status. Currently, there are no appropriate methods that compile individually tailored behavioural standards and can detect behavioural changes against this standard. Moreover, we lack fundamental knowledge on circadian behavioural activity in many species. To address these challenges we use off the shelf camera traps to acquire images over a long time period and apply recently developed computer vision and machine learning algorithms to analyse the images automatically. Promising preliminary results have been obtained for large exotic species as well as farm animals.

Beyond bases: How cameras, audio recorders and citizen scientists are revolutionising Antarctic ecology

Dr Tom Hart, Department of Zoology, University of Oxford

Many of the conservation decisions we make are compromised by a lack of data – some species are naturally rare and hard to find. Others do some of their most important behaviour when we can't see them. The biology of the Southern Ocean is changing and we need a step-change in the amount of biological data collected to understand the relative threats of climate change, fisheries, human disturbance and disease to animals in the region. Technology is finally delivering this; with a mixture of satellite imaging and novel ground recording stations, we can now monitor an area far greater than before. Autonomous recording stations have the potential to revolutionise data collection as they are able to collect many of the parameters of breeding that usually require long-term researcher presence in the field. Once automated data collection is in place, the question becomes how to analyse such a vast volume of data. Using crowd sourcing and automation, I show how automated analysis of the data collected is feeding into monitoring and management of the Southern Ocean.