

INTRODUCTION

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Camera trapping in wildlife management and research is a growing global phenomenon. The technology is advancing very quickly providing unique opportunities for collecting new biological knowledge. In recent years, ecologists using camera traps have discovered new species to science (e.g. Rovero *et al.* 2008), rediscovered others (e.g. the saola, *Pseudoryx nghetinhensis*, in Vietnam, Anon 2013) or extended the known range, recorded new behaviours and successfully conveyed these findings to a wider audience by using the pictures (e.g. Bahaa-el-din and Henschel undated; WWF-Canon Global Photo Network undated). The number of publications reporting the use of camera traps has also increased at a feverish pace (Rowcliffe and Carbone 2008; Rovero *et al.* 2013), although the adoption of camera traps travels at a far greater speed than journals can publish research findings. The camera trapping methods and analyses book edited by O'Connell *et al.* (2011) report on an international camera trapping symposium within the 9th International Mammal Congress, yet there have been very few fora where the technical and practical issues, best practices for particular applications, constraints and good news stories about camera trapping in a range of applications were discussed and debated.

There was recognition amongst scientists, practitioners and two wildlife societies that bringing together international users and experts would be a valuable contribution in the sharing of knowledge and experience, and towards fast tracking the refinement of camera trapping methods for wildlife research and management. This book collects the presentations of this unique symposium and workshop held in September 2012 and subsequently renamed the First Interna-

tional Camera Trapping Colloquium. It was not possible for the editors to include all of the presentations or any of the poster papers; however, we believe that a broad and valuable range of topics on contemporary camera trapping has been provided. The book has 32 scientific papers and one overview representative of the presentations given at the colloquium.

The book is set out in four sections, corresponding to topics of most interest identified in a survey of camera trapping wildlife managers and scientists:

- 1 camera trapping for animal monitoring: case studies;
- 2 camera technology, constraints and pitfalls;
- 3 camera trapping survey design and deployment; and
- 4 camera trapping data management and image analysis.

This book includes papers that describe the multitude of ways that camera traps are used in wildlife projects. There are examples of how the devices can be used to involve communities in citizen science and education through to purely scientific investigations of animal presence abundance and behavioural ecology. As humans are visual beings, camera trap images capture the interest of people of all cultures and are powerful tools for informing and educating them about wildlife. Several papers describe the how camera trapping has introduced a new role for non-scientific people to play in wildlife management. It has also been described as a powerful tool in educating and rallying support for conservation programs without the need for language. Conversely, some authors raise questions about the downsides of camera trapping, posing some inter-

esting issues about how reliable these devices are. Several concerns are discussed regarding the variability between camera models and how this can affect results. Issues related to how cameras are placed and their settings are also outlined by several authors, highlighting how much we still have to learn about the technology and maximising its capabilities. There is recognition that how we use camera traps in scientific investigations requires the same, if not more, consideration than studies using standard tools. Sampling designs that enable determination of statistical and biological significance of camera trap data should remain the scientist's primary directive in wildlife research and monitoring projects. The point is made clear in this book that we as practitioners need to remember that camera traps are just one arrow in our quiver of measuring tools and methods. A camera trap should not be an automatic surrogate for other techniques, especially at the expense of proven methods or high-quality data. Conclusions drawn from a few images from camera traps are just as fraught as generalisations made from single observations or measurements with any other tool.

The management and analysis of camera trapping data is the obstacle in the way of adoption of these devices for many agencies and individuals. The sheer volume of images that are collected on camera traps is a considerable storage problem, which often comes as a surprise to first-time users, and which is insurmountable for some whose programs would benefit from their use. People usually purchase and deploy camera traps before considering data storage and management, and how they might analyse their images. Consequently, there is considerable variability in how people collect, store, file, manage and analyse their data; in fact, it is safe to assume that many datasets never make it to the analysis phase because of these issues. The presentations and discussions outlined in this book reaffirm that data management and analysis are critical matters for practitioners globally. Information provided in this book should help progress the systems and opportuni-

ties for practitioners to better manage their data and evaluate their results.

Throughout this book there are unequivocal evidence and support for refining camera trapping methods and some of these issues are discussed in the final paper, which is an overview of the workshop discussions. The aim is to identify the future dimensions of camera trapping and identify pertinent challenges to the next era of camera trap use by wildlife practitioners. This book provides new insights into the use of camera trapping as a survey tool. It serves as a platform upon which wildlife practitioners can launch future investigations and develop better ways to use camera traps. The First International Camera Trapping Colloquium in Wildlife and Research was highly successful and the first of what we propose should be a biannual forum, specifically designed to progress the effective use of camera trapping in wildlife management and research.

References

- Anon. (2013) Saola rediscovered: Rare photos of elusive species from Vietnam. (World Wildlife Fund).
- Bahaa-el-din L, Henschel P (undated) 'Camera Trap Photos of African golden cats.' <http://www.flickr.com/photos/pantheracats/sets/72157627315787869/>. Accessed 10/02/2014
- O'Connell AF, Nichols JD, Karanth KU (2011) 'Camera traps in animal ecology: methods and analyses'. (Springer: New York).
- Rovero F, Rathbun GB, Perkin A, Jones T, Ribble DO, Leonard C, Mwakisoma RR, Doggart N (2008) A new species of giant sengi or elephant-shrew (genus *Rhynchocyon*) highlights the exceptional biodiversity of the Udzungwa Mountains of Tanzania. *Journal of Zoology* **274**, 126–133.
- Rovero F, Zimmermann F, Berzi D, Meek PD (2013) Which camera trap type and how many do I need? A review of camera features and study designs for a range of wildlife research applica-

tions. *Hystrix Italian Journal of Mammalogy* **24**, 148–156.

Rowcliffe JM, Carbone C (2008) Surveys using camera traps: are we looking to a brighter future? *Animal Conservation* **11**, 185–186.

WWF-Canon Global Photo Network (undated) 'WWF-Canon Gallery: Camera traps around the world.' <http://www.flickr.com/photos/wwfint/sets/72157612803173114/>. Accessed 10/02/2014