

Combating wildlife crime

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It is with great pleasure that I introduce this special edition dedicated to wildlife crime. Wildlife crime is an important area of law enforcement that I have a strong commitment to. It involves the illegal trade in animals, plants and their derivatives and can result in the depletion of natural resources, invasion of pest species and the transmission of diseases. For the first time an international journal has dedicated an entire edition to the issue of wildlife crime, bringing together submissions from numerous global experts regarding their work in this area. The aim of this initiative is to generate attention to this significant criminal activity.

The current global situation is summarized and discussed in the commentary by Wilson-Wilde [1]. In a positive move, international action is becoming more coordinated and an overview of the 2009 INTERPOL Wildlife Crime Group meeting in Brazil is presented in the commentary by Neme [2].

At the international level there are 175 signatories to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) [3]. CITES provides a system of control to inhibit the exploitation of animals and plants and prevent trade from threatening the extinction of endangered species. Fauna and flora are listed on one of the three Appendices of CITES. Appendix I lists species where international trade is prohibited (exceptions are made for non-commercial purposes, such as scientific research), Appendix II lists species where international trade is regulated in circumstances where the trade does not endanger

the survival of the species and Appendix III lists species where international trade is regulated at the request of a particular country (for example Uruguay has listed the eleven banded armadillo). Paramount to the enforcement of CITES and the subsequent prosecution of offenders is the ability to identify the species in question. Alacs et al. [4] provide an excellent review of genetic DNA analysis methods used in the forensic investigation of wildlife crime, covering various available techniques that can be applied and techniques that have potential for future application. Tobe and Linacre take this a step further investigating the use of DNA techniques in mixed samples from more than one species [5] and Spencer et al. [6] extend DNA techniques to the analysis of historical and degraded samples with much success.

Offenders of wildlife crime can be categorized into three main groups; minor offenders, organized illegal trading and serious major criminal activity [7]. Minor offenders generally relate to abuses against conditions in permits and are more opportunistic types of crime. These offenders are usually tracked through inadequate record keeping and generally involve exchanges between wildlife collectors. Organized illegal trading moves into the realms of deliberate clandestine poaching with intent to make gain and meet the needs of the market. It requires planning and can threaten wildlife, with no consideration of their habitat, for monetary gain in selling specimens on the black market. Serious major criminal activity differs from the latter in that it is highly organized involving major criminal groups who are professional, financially backed and specifically market products. These offenders may also be involved in major fraud and drug shipping [7]. Therefore combating criminal activity requires a well-equipped forensic facility to provide cutting edge technology, maximizing evidentiary outputs. Setting up such a laboratory is not easy and

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Ogden clearly highlights some of the issues and provides an insight into how this might be achieved [8].

It is difficult to ascertain specifically what drives demand in particular wildlife trade; however it is thought that a number of factors such as fashion, rarity of the species, trends in alternative remedies and medicine and criminal elements each play a part. Fashion can have a major impact and is highly variable. Particularly endangered species cost more and can therefore be in higher demand by collectors due to higher profits compared to the risks and penalties incurred. Simply placing a species on the CITES list, Appendix I can make a species more appealing. Yates et al. [9] look at the identification of hairs from elephant and giraffe used in traditional style jewelry (presumably bound for the tourist trade) using light microscopy.

A number of very interesting case studies are included in this edition to highlight the impact wildlife crime has on the animals involved and the type of forensic analysis that must be undertaken to assist the investigation. Byard et al. [10] present a case study on unusual upper aerodigestive tract obstructions in wild dolphins causing death. Byard et al. [11] also discuss a case study on unexpected deaths in captive fur seals and Carapetis et al. [12] present a case illustrating the consequences of ingesting foreign material by seabirds. In the article by Johnson two interesting case studies are discussed regarding the illegal importation of live bird eggs and the illegal possession of shark fins [13].

Wildlife crime also includes offences involving domesticated species, such as animal cruelty cases and where an animal may be used to link an individual to the commission of an offence (for example dog hairs on a suspect). El-Sayed et al. [14] investigate the use of DNA analysis in domesticated species and Clarke and Vandenberg look at the application of canine DNA profiling in forensic casework [15]. Wilson-Wilde et al. [16] look at species identification in the context of a laboratory conducting standard DNA analysis and implications and recommendations for implementing a species identification method. Two book reviews are also included in this special edition, *Forensic Science in Wildlife Investigations*, edited by Linacre and *Introduction to Veterinary and Comparative Forensic Medicine* by Cooper and Cooper.

We hope that the various concepts, research and issues discussed in this edition are thought provoking and provide an insight into this significant global issue.

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