International Journal of Pure and Applied Zoology
Volume 13, Issue 3, pp: 291, 2025
http://www.alliedacademies.org/international-journal-of-pure-and-applied-zoology/

ISSN (Print) : 2320-9577
ISSN (Online): 2320-9585

Opinion

Wildlife Forensics: An Introduction to the Science of Wildlife Crime Investigation.

Sushanto Prosnier*

Amity Institute of Forestry and Wildlife, Amity University, India

Introduction

Wildlife forensics is an emerging field that applies forensic science to the investigation of wildlife crimes. It is a crucial tool in protecting biodiversity and enforcing laws aimed at preventing the illegal exploitation of animals and their habitats. Wildlife crimes, including poaching, illegal wildlife trade, habitat destruction, and the use of endangered species for commercial purposes, have become significant global concerns. These activities threaten ecosystems, endanger species, and disrupt the delicate balance of the natural world [1].

The science of wildlife forensics combines various disciplines, including molecular biology, toxicology, and veterinary sciences, to identify perpetrators, trace the origin of animal products, and determine the causes of death in suspected poaching cases. It not only helps in solving specific criminal cases but also plays a vital role in broader conservation efforts by providing critical evidence that supports law enforcement and policy development. This article explores the core principles of wildlife forensics, its techniques, and its importance in the fight against wildlife crime [2].

Wildlife forensics is central to addressing illegal wildlife trade, which has grown into a multi-billion-dollar global industry. From rhino horn trafficking to the smuggling of exotic birds and reptiles, the illicit wildlife trade is often driven by demand for rare and endangered species in international markets. Forensic analysis provides the tools needed to track the origin of animal products, uncover smuggling routes, and gather evidence that can lead to the apprehension of criminals [3].

One of the primary challenges in wildlife crime investigations is identifying the species involved. Forensic scientists use genetic techniques such as DNA barcoding to distinguish between similar-looking species and confirm whether they are protected or endangered. Genetic profiling can also identify the geographical origin of an animal or animal product, helping trace the source of poaching or illegal trade [4].

Forensic veterinarians and pathologists analyse the physical remains of animals to determine the cause of death. Whether through autopsies or analysis of trauma, forensics can uncover whether an animal was killed by poachers, through environmental hazards, or through other unnatural causes. This information can provide critical evidence in prosecuting wildlife crimes. The trade in animal products such as ivory, tiger bones, or exotic skins often involves sophisticated smuggling operations. Wildlife forensics can help trace these products through chemical markers or isotopic analysis to identify where they originated. This information is crucial for dismantling illegal networks [5, 6].

DNA testing is one of the most powerful tools in wildlife forensics. It can be used to identify species, establish the geographic origin of a specimen, and link individuals to specific populations. DNA can be extracted from a variety of biological samples, including blood, hair, faeces, or even dried skin cells. Microscopic techniques are used to examine physical evidence such as skin, feathers, hair, and scales [7, 8]. This can help identify species, determine the health of the animal, and find signs of trauma or unnatural death. Isotope ratios in an animal's tissues can provide information on its diet and habitat. This technique is particularly useful for tracking the geographical origin of poached wildlife and animal products, especially in cases involving migratory species or species with large ranges. Poisoning is a common method used in wildlife poaching and illegal hunting. Forensic toxicology helps to identify poisons or toxins in animal tissue, which can indicate the methods used to kill the animal. It is particularly important in cases of targeted killing, such as the poisoning of vultures or elephants [9, 10].

Conclusion

Wildlife forensics is a vital component in the fight against wildlife crime, providing scientific methods to investigate and prosecute individuals involved in illegal poaching, trafficking, and other crimes against wildlife. It is an interdisciplinary field that draws on genetics, veterinary science, toxicology, and other branches of forensic science to uncover critical evidence. As wildlife populations continue to face unprecedented threats from human activity, the importance of wildlife forensics will only grow.By using advanced scientific techniques to trace animal products, identify perpetrators, and determine causes of death, wildlife forensics empowers conservationists, law enforcement agencies, and governments to protect endangered species and preserve biodiversity. In the ongoing battle against wildlife crime, wildlife forensics stands as a crucial ally, providing the tools needed to uncover the truth and bring criminals to justice.

Reference

1. McCollum, S.A., and Leimberger, J.D., 1997. Predator-induced morphological changes in an amphibian: predation

***Correspondence to:** Sushanto Prosnier, Amity Institute of Forestry and Wildlife, Amity University,India, E-mail: sushantopri@gmail.com

***Received:** 05-May-2025, Manuscript No. IJPAZ-25-165360; **Editor assigned:** 07-May-2025, Pre QC No. IJPAZ-25-165360 (PQ); **Reviewed:** 14-May-2025, QC No. IJPAZ-25-165360; **Revised:** 22-May-2025, Manuscript No. IJPAZ- 25-165360 (R); **Published:** 31-May-2025, DOI: 10.35841/ijpaz-13.3.291*

by dragonflies affects tadpole shape and color. *Oecologia*, 109: 615-621.

2. Williams, B.K., Rittenhouse, T.A., and Semlitsch, R.D., 2008. Leaf litter input mediates tadpole performance across forest canopy treatments. *Oecologia*., 155: 377-384.
3. Milotic, D., Milotic, M., and Koprivnikar, J., 2017. Effects of road salt on larval amphibian susceptibility to parasitism through behavior and immunocompetence. *Aquat. Toxicol*., 189: 42-49.
4. Straus, A., Reeve, E., Randrianiaina, R.D., Vences, M., and Glos, J., 2010. The world's richest tadpole communities show functional redundancy and low functional diversity: Ecological data on Madagascar's stream-dwelling amphibian larvae. *BMC Ecol*., 10: 1-10.
5. Behringer, D.C., and Duermit-Moreau, E., 2021. Crustaceans, one health and the changing ocean. *J. Invertebr. Pathol*., 186: 107500.
6. Gess, R.W., and Whitfield, A.K., 2020. Estuarine fish and tetrapod evolution: Insights from a Late Devonian (Famennian) Gondwanan estuarine lake and a southern African Holocene equivalent. *Biol. Rev*., 95: 865-888.
7. Colbert, E.H., 1965. The appearance of new adaptations in Triassic tetrapods. *Isr. J. Zool*., 14: 49-62.
8. Ferner, K., and Mess, A., 2011. Evolution and development of fetal membranes and placentation in amniote vertebrates. *Respir Physiol Neurobiol*., 178: 39-50.
9. Davit-Béal, T., Tucker, A.S., and Sire, J.Y., 2009. Loss of teeth and enamel in tetrapods: fossil record, genetic data and morphological adaptations. *J. Anat*., 214: 477-501.
10. Kuraku, S., 2021. Shark and ray genomics for disentangling their morphological diversity and vertebrate evolution. *Dev. Biol*., 477: 262-272.