

Abstract – TWS 2025

New Technology and Applications

Enhancing Wildlife Monitoring: Comparing Aerial Sensor Technologies for Conservation

Wildlife monitoring presents unique challenges, requiring innovative tracking methods to optimize research and conservation. Aerial tracking using aircraft or Unpiloted Aerial Vehicles (UAVs) offers significant advantages over ground-based surveys, enhancing speed, safety, and automation. However, species and habitat complexity influence sensor effectiveness, making method selection critical. Herein, I compare different tracking technologies and their applications in conservation, including radio telemetry, visual, and thermal imagery, and evaluate efficiency across varied species and habitats.

VHF radio telemetry remains a key tool for locating wildlife in forested landscapes. However, traditional receivers require sequential scanning and stationary positioning for triangulation, leading to inefficiencies and missed detections while moving. Multi-Track receiver technology addresses these limitations by monitoring up to 500 frequencies simultaneously, and tracking while moving without requiring hovering, rotating, or collecting multiple bearings. This innovation facilitates rapid data collection and improves the accuracy of aerial telemetry.

Aerial imagery is useful for locating and counting wildlife in open environments, and does not require capturing and tagging animals. However, species recognition and accurate counts can be challenging and time-consuming in complex terrain, and with large numbers of animals and images. Artificial Intelligence (AI) assists researchers with faster counts and improved detection accuracy across varied conditions.

This research demonstrates the importance and effectiveness of technology for locating diverse species across varied habitats. Comparisons with different sensor technologies highlight improved efficiency and accuracy in wildlife searches. By leveraging advancements in aerial tracking, researchers can refine conservation strategies and develop new solutions for monitoring elusive species.