



New Technologies in Anti-Poaching



Context

Driven by a growing demand from Asia's urban wealth centres, wildlife trafficking is significantly accelerating global biodiversity loss and species extinction. Protected area management authorities endeavour to respond to this crisis with robust, reliable law enforcement and anti-poaching systems. Governments and the conservation community seek new effective and efficient solutions to monitor the often vast ecosystems most affected by poaching. As technologies are continuously becoming more advanced, handy, affordable and, therefore, much more widespread, new opportunities are opening up for the collection, transfer and analysis of data – also in the context of conservation. Much hope is put into emerging surveillance and conservation technologies, including Unmanned Aerial Systems (UAS) or drones, camera traps, thermal imaging, radar, alarm fences, wildlife tracking tags and tools such as SMART (Spatial Monitoring and Reporting Tool), a ranger patrol analysis software programme. The tools and methods can be used for monitoring and cartography purposes as well as for the detection and prevention of poaching activities. However, they also bring about new challenges and many practitioners have become rather disillusioned by the capabilities of low-budget solutions.

Our Approach

The fight against poaching of elephants and rhinos is at the heart of Germany's efforts, as these species are particularly affected by illegal trade and are representative for the health of important African ecosystems. Within its focus area "Stop poaching in Africa – Securing livelihoods and habitats" Germany supports, among other measures, the improvement of protected area management for example through the provision of capacity building and equipment. Many of the new tools and technologies are currently tested in projects across the African continent.

The use of **UAS** has increased rapidly over the last decade. They can perform a multitude of different tasks and are applied in anti-poaching measures to overcome two of the most pressing problems:

- enlarge the territory that can be surveyed and patrolled in due time by placing an "eye in the sky";
- deprive poachers of one of their main advantages, their hidden mode of operation under the cover of night.

Camera traps automatically record passing animals or humans. Some camera trap systems use satellites to send images in near realtime to rangers or park authorities. Optical cameras deliver high-resolution pictures or videos in daylight, whereas infrared cameras take thermographic pictures, enabling the identification of warm objects against colder backgrounds. However, their resolution is much lower compared to optical cameras.



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1. Camera equipped drone

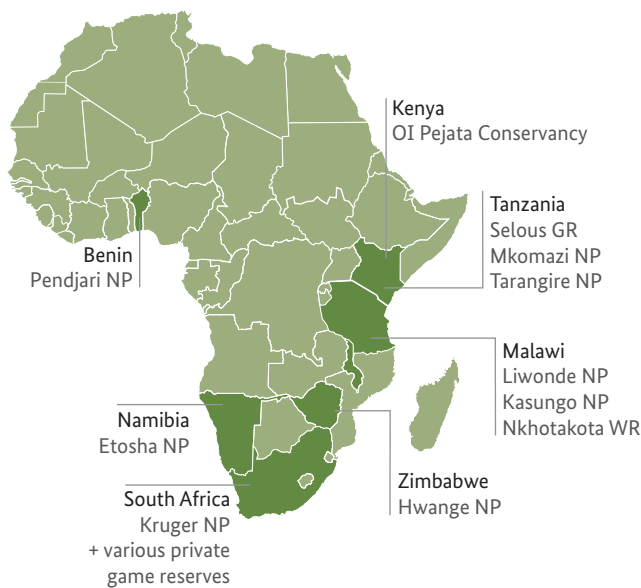
2. Aerial view of a herd of elephants in the Okovango Delta/Botswana.

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Ranger-based monitoring is still widely recognised as an important tool to increase the effectiveness of management systems. It describes the technique of rangers collecting relevant information on wildlife and human activities on their patrols. One of the most widespread solutions – being used in more than 140 sites in 30 countries – is SMART. The software is designed to measure and evaluate the effectiveness of law enforcement patrols: It can help to plan strategic anti-poaching response or enhance accountability and good governance by transparent documentation of patrols.

An Example from the Field

German Development Cooperation is supporting the evaluation of camera traps and drones in the field. One of the regions where the technologies are currently tested is the W-Arly-Pendjari (WAP) Transboundary Biosphere Reserve in West Africa. While both tools deliver pictures and videos that are transmitted in near realtime, park authorities lack the necessary capacities to handle the large amount of data being generated and to react in due time. Moreover, pictures of illegal activities have so far not been accepted as evidence in court.



Way Forward

Given the limited capacities of many park administrations in terms of human and financial resources as well as the often weak institutional and organisational context, there is an urgent need for automated data analysis and improved and standardised organisational processes.

Much of the progress that technologies have brought to the fields of ecology and conservation is about supporting the human observer with instruments that can gather information more widely in space and time. New technologies should therefore be seen as tools to supplement management systems, but never as a substitute of any other law-enforcement component.

New technologies provide rangers with real-time picture and video surveillance of large areas and therefore optimise the use of limited resources while supporting tactical operations. However, many of them still come at a high cost, require high expertise and the analysis of the data often demands for extensive workload. Also, there is a great diversity of tools available being very different regarding their benefits for anti-poaching, so the choice for the right system must be made very carefully. German Development Cooperation supports training of rangers and park authorities to make these decisions as good as possible and to use the technologies and the resulting data effectively.

Selection of protected areas in Africa where UAS have been employed/ tested for anti-poaching.

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