

## On the need of big data and capacity building for conservation: the Snapshot Safari South Africa experience

Biodiversity is declining rapidly in many regions worldwide. However, to understand ecosystems and species patterns, systematic monitoring and new data collection approaches are needed. Therefore, scientists are developing tools to assess these patterns in the most accurate and timely way possible to inform conservation planning. In this sense, new technologies such as landscape or climatic sensors are crucial tools to collect information continuously to anticipate particular events. For species diversity, camera traps have become the most popular way for collecting mammals data and there are large projects aiming at monitoring this group using this technique. Cameras are so effective that they generate not thousands but millions of photos, and the management of these large data sets presents many challenges. Here, we highlight the experience of the Snapshot Safari project, a large camera trap network aiming at monitoring mammal diversity in southern Africa, and reflect on the progress and limitations to manage and analyze camera trap data for conservation purposes. Snapshot Safari South Africa uses cutting-edge technology to detect species and citizen science to classify pictures through an online platform called Zooniverse. However, to improve data processing we have also partnered with WildEye, whose TrapTagger platform uses machine-vision technologies to increase both the speed and accuracy of the data annotation process. To facilitate data sharing we are building open-source codes and repositories so researchers can access and explore our data. However, we are still in need of standardized data processing tools that help us to provide not only raw data but also basic results that can help managers to inform conservation practice. In this sense, the need to create capacity building and to work closely with other fields such as engineering and statistics has never been so important in order to inform conservation policies. We believe Snapshot Safari has the potential to expand our knowledge of southern African mammals and terrestrial birds species and add up to current worldwide monitoring programs that will help to understand planetary trends and inform management decisions.