UAS will help protect wildlife in DRC

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Adaptive management and conservation of natural ecosystems require effective monitoring which means that regular surveys and rapid response are needed. However, particularly in tropical areas, such surveys are logistically difficult to implement due to the lack of means and appropriate material, making long-term monitoring difficult to plan. Tropical regions also have harsh field conditions and there can moreover be important risks for the monitoring teams when it comes to aerial surveys or when facing poachers. Consequently of those limitations, the time between surveys can be very long, making effective monitoring impossible.

The recent advent of UAS (Unmanned Aerial Systems) in civilian applications and the fast growing development of teledetection and GIS applications announce a new era for a more regular monitoring of natural ecosystems. Indeed, UAS possess numerous undisputable advantages. They have reduced costs and ecological footprint and they are easy in terms of logistic and manipulation. That gives them a high spatial and temporal resolution in comparison with other remote sensing platforms. Finally, they can work in various environments and climatic conditions. The use of lightweight unmanned aerial vehicle could soon become a viable alternative method to help wildlife protection.

To do so there are three principal axes in which UAS have to be efficient and which will be developed in a new project led by the Department of Forests, Nature, Landscape of Gembloux Agro-Bio Tech (University of Liège) in the protected areas of the Democratic Republic of Congo.

The first axis is the anti-poaching surveillance. We will develop new protocols using embarked video cameras with direct retransmission. The use of thermic cameras will help detect human presence and campfires. The quiet motors of electric UAS and the good resolution of the captors should allow a good view of those illegal activities without putting in danger any human lives. The GPS data collected in real time give then the possibility to send rangers on the spot well aware of the field situation.

The use of UAS to replace traditional aerial counts is one of its biggest applications in wildlife conservation and probably the most challenging. Indeed, different parameters have to be approached in a different way than before. The detection of species has to be evaluated and detection rates will have to be calculated when estimating the population size. The limited endurance of UAS also makes it impossible to simply use the same protocols than for inventories with manned aircrafts. New sampling plans should be developed adapted to the field conditions and surfaces to survey. The creation of new protocols means that we have to rethink the statistical methods to adapt it to those challenging situations.

Finally, UAS can be used for various punctual surveys. They can be used for the detection of some particular species or individuals, to follow groups and migrations and to study the behavior of animals. They can also help in the monitoring of protected areas by showing the impacts of humans activities such as fires, crops, people and vehicles, carcasses …