**\*Slide intro**

\*clicG - Protected areas preserve values

\*clic - These values can be animal and plant species,

\*clic - as well as ecosystems. These are the values that need to be maintained in a sustainable way. It is therefore important to be able to measure the current state and the evolution of these values, as well as to detect the threats they are facing.

Clic - \*B - In Burundi for instance, an invasive plant species, the Lantana, has taken over Ruzizi National Park. To avoid this situation, the problem should have been identified upon finding the plant in the park. It is now probably too late, and the park has lost an important part of its ecological value.

\*clicG - Ecological monitoring is a key step in adaptive management, but it is not the only tool that can get information from the field.

\*B - Other means such as anti-poaching surveillance, research and tourism can also provide a lot of information

\*G – Ok but ecological monitoring remains the main source to guide decisions and actions for site management.

\*clicB - In the early 2000s, when the population of Black Rhinoceros in the North of Cameroon disappeared, strict ecological monitoring like collecting droppings for instance, would have allowed to identify the imminent threat of extinction,

\*clic - or at least to stop useless surveillance once the species disappeared.

\*clicG - We know that a protected area is a special kind of territory with several characteristics: it is defined, recognised, dedicated and so on, and it is managed for the conservation of nature. Keep in mind that this is its primary goal, as we explained in the MOOC on Protected Area Management, in the 4th sequence of the first module.

\*clicB - But ecological monitoring can be applied to many territories and species outside of protected areas. For example, swallow populations are being monitored in Europe in order to measure the impact of pesticides. In the case of a PA, ecological monitoring intends to show that the goal of the PA, its conservation, is being achieved. Monitoring is hence intentional and targeted.

\*clicG - Indeed, and it is especially interesting to have ecological monitoring in a PA since it is usually a significant ecosystem on a national or regional level, and it contains complete or at least sufficiently representative ecological processes for successful research.

\*B - Since the PA is being managed, it offers a good working base with means and infrastructures, and sometimes available and qualified staff.

\*clicG - A protected area allows for long term monitoring, and can provide historic data, which increases knowledge. It is a good place to experiment, and it allows for a wide distribution of information, to other PAs of the same kind for example.

\*clicB - It can also be a good medium for sharing results with different targets, in schools or universities, but also with the general public. Therefore, PAs play an important part in raising awareness for conservation.

\*clicG - As we saw in the MOOC on Protected Area Management, the management of PAs is organised according to a management plan, defined in a participatory way with clear goals, concrete activities and assigned responsibilities.

\*B - Ecological monitoring has to be integrated to the preparation of this plan to ensure it will give relevant indicators, but also that it will be effectively implemented. It is useless to plan actions that cannot be assessed, or to associate them with indicators that cannot be measured.

\*clicG - Ecological monitoring must be discussed, shared and understood by everybody involved in its implementation, and the park's manager need to take ownership of the plan from the very start.

\*clicB - Ecological monitoring is obviously part of the PA management, but it is also one of the tools used to measure the effectiveness of said management. As we saw in the MOOC on Protected Area Management, monitoring needs to be subject to protocols as well as to reliable methods to be implemented.

\*G - It is important to note that it is one of the rare possible sources of information regarding the impact of our management actions, for example by showing the evolution of the environment over time, according to our decisions.

\*clicB - Therefore, regular monitoring of the state of plants can show that repetitive bush fires in grasslands lead to the disappearance of some useful grass species. This finding will allow to choose a better adapted season and a periodicity for the ignition.

\*clicG - Ecological monitoring accounts for the state of the PA and identifies the pressures and threats it is facing. It is important to base it on matters that will allow making the best decisions in controlling those risks.

\*B - Since means will necessarily be limited, monitoring needs to be prioritised, and should not compete with more urgent actions. This reinforces the necessity for good coordination with all those involved in management, in and around the PA, from the implementation of the monitoring protocol onwards.

\*G - To make it simple, a useless ecological monitoring program is worse than none at all.

\*clicB - Ecological monitoring is also an important tool in training and motivating staff. It empowers rangers, eco-guides, volunteers... and includes them in the management process, not as mere implementers but as the providers of information that is at the very heart of the decision-making process.

\*clicG - By giving access to new tools such as cyber-trackers or GPSs, ecological monitoring broadens agents' skills, and since they are in touch with researchers, their personal knowledge is being developed.

\*clicB - Monitoring is also a powerful tool in collecting funds for a PA. By providing reliable and transparent information regarding the state of the conservation and the progress made, it makes it possible to justify the use of received funds.

\*G - Yes, in a documented way for once! By proposing new targets or activities, it justifies access to additional funding. It serves as a tool for accountability we know that, but also for prospection.

\*clicB - Ecological monitoring is also a vector for internal organisation. It strengthens the collaboration between the departments of a PA: admin, research, surveillance, communications, training... because it is multidisciplinary, and needs everybody’s input to be successful.

\*G - For example, storing collected data is key to monitoring sustainability – to process this information within the PA and store all the data, the entire organisation is engaged

\*clicB - Beyond the management aspects, ecological monitoring of course has its own distinctive role, which is to inform on species and ecosystems. You get to know what species inhabit the PA, in what numbers, during which seasons, at what places...

\*G - On this basis, ecological monitoring will measure the variations in space and time, short, medium and long term. You can then understand the interactions, measure the impacts of the pressures and better estimate samples to be taken.

\*clicB - For example, monitoring elephant populations within the Kruger National Park and of their impact on plants, has allowed determining the threshold at which said population needs to be maintained at, in order to prevent damages on the ecosystem that will be detrimental to other species.

\*clic - The next step is to figure out how to do it, and that's another story!

\*clicG - Ecological monitoring is crucial in the PA management process. It is quite surprising to find that many parks don't have a monitoring protocol in place at all. Others have one but it doesn't give any information on the state of the values, or it is based on outdated techniques, or the produced results aren't understood, or shared or used...

\*B - And this is not the case in a minority of sites, on the contrary, it is the situation of a vast majority of PAs where management has turned into a plain and systematic repetition of actions, with no effort put into assessing the impacts.