**Sequence 1.11 – Helpful animal ecology concepts to determine the surveying method and sampling plan**

We've seen that ecological characteristics of animal species influence the choice of key ecological attributes that will define the species’ condition. But ecological specificities also play a part in choosing the surveying method and the sampling plan to implement.

The type of habitat of the considered species is key in choosing the surveying method to apply to the field. If the species are difficult to spot because they live in an area with dense vegetation, indirect methods proving the presence of the species and give an idea of their number (droppings, nests, tracks etc.) should be used. For instance, Duikers are small antelopes living in the understory. It is therefore difficult to spot them, but they are territorial and mark their territory by visible heaps of droppings. These are the elements that should be monitored. On the other hand, larger species living in open spaces can be subject to direct ground-based or aerial surveying.

What about sampling and the ecological factors that guide it? In this case, the area over which a species is distributed, or its daily and seasonal travel rhythm, influence the method to use and the way it should be implemented. Thereby, a species distributed over a smaller area will undergo closer monitoring of its overall population, compared to a species covering more ground – in this case the species will be monitored by a random sampling process in the entire park. Obviously, if you want to assess a change of population, as small as it may be, more samples need to be collected in order to be able to detect the change. Also, if a species moves about different habitats, it isn't a bad idea to consider proceeding to stratified sampling where each stratum is represented by one of the possible habitats used by this species.

Ecological factors also influence the time when surveying should take place. To maximise the possibilities to observe the monitored species, the surveying needs to take place at a time of year or the day when it is most active and easiest to observe. For instance, wildebeests leave Serengeti in Tanzania to enjoy the greener pastures of the Masai Mara in Kenya when it's already raining there. So the managers of Serengeti and Masai Mara proceed to the monitoring of wildebeests at different times according to this annual rhythm.

Finally, there are also ecological factors that influence the frequency of data collection. The more the considered species is likely to adapt rapidly to new constraints, like changing territory to escape threats, the more you would need to increase the frequency of surveying in order to be able to detect these changes on time, and take the right management actions. Conversely, to monitor a normal increase of the population, it is useless to proceed to a yearly count of the population of elephants whose natural growth is around 5 or 6%, if the lack of precision of the chosen surveying method is in the range of 20%. In this case, it is better to go for a five or ten-year surveying frequency.

In short, the concepts of ecology to master, in order to design an ecological monitoring plan of a given species that will make surveying easier, are to know:

* Its suitable habitat type
* Its social system that determines the composition of the groups and their seasonal variation
* The frequency and the way daily and seasonal travels occur
* The normal growth rate of its population
* Its tolerance to threats such as poaching
* Competition with other species (wild or domestic)
* Human presence
* Changes of its habitat
* The type of visible markers that indicate its presence (nest, droppings, tracks, broken trees etc.).