**4.6. Example of ecological monitoring in the forest: Taï National Park in Côte d’Ivoire**

Taï National Park (TNP) is located in the South-West of Côte d’Ivoire. With its extension of the N’zo fauna reserve in the north, the TNP covers a surface area of around 536,000 hectares (or over 1.3 million acres). It is the largest protected primary rain forest in West Africa. The park being listed to the International Network of biosphere Reserves in 1978 and World Heritage in 1982 in the framework of the MAB-UNESCO programme shows how important it is.

For this case study, we will be looking at the 10-phase ecological monitoring program implemented in the NTP between 2005 and 2015 to monitor all the animal populations. This sequence is based on the results of data collected during phase 4, which took place between August 2008 and February 2009, as well as those from phases 2 and 3. We will specifically look at the “Duiker” value.

Ecological monitoring in the TNP aimed at assessing the following ecological attributes:

* What is the duiker population size within the park?
* What types of threats do they face in the park?
* How are these attacks and duiker populations distributed inside the park?

The ecological monitoring method used to inform on these 3 ecological attributes is based on a total sweep of the park following transects. The aim was to look both for direct and indirect indicators of duiker populations (and other animal populations). Relative pressures were also noted.

The first illustration shows the layout of different transect groups throughout the park. So, 368 km of transects divided into 5 zones were roamed by sampling teams working simultaneously. Each transect measures 2 km, they are laid out irregularly throughout the park in groups of four separated by 8km, and within a group, transects are separated by 1 km.

The data analysis mainly consisted in calculating encounter rates and proportions from the raw data, in order to estimate the population size of duikers in the park. Maxwell’s duiker remains the most prevalent species with 0.52 individuals per km. The Bay-duiker is the second most encountered species, and the scarcest ones are the Yellow-backed (3%) and the Zebra duikers (2%).

To get an idea of the distribution of species in the park, simple distribution maps were drawn up using the ArcGis 9.2 software, by combining geographical coordinates with the observations made per transect.

Just as in phases 2 and 3, indicators of duiker presence were found throughout the TNP. Areas with higher concentration (more than 10 indicators/km) were mainly in the east, as opposed to phase 2 where there were almost no zone with high concentration of indicators. This situation could be a sign of progressive recolonization of duikers in the entire TNP.

The total number of observations made on these transects is important and reaches over 11,000, all species included. Most were bovines (39%). By the way, during this phase, the number of direct observations has practically doubled going from 282 (during the previous phase) to 484 today.

Human activities, essentially illegal (hunting, placer mining etc.) represented 4% of recorded observations. But the most encountered indicators of human activity were tracks (300 observations), traps (171 observations) and cartridge cans (131 observations).

Even though there were more indicators of fauna attacks during phase 4 (319 total observations), the critical encounter rate of 1 indicator per km has not yet been reached. Furthermore, the encounter rate of poached trails was reduced by more than half, and in phase 4 went from 1.01/km to 0.42/km. As for traps, their encounter rate hasn’t changed much but is slowly decreasing: it went from 0.55/km in phase 3 to 0.47/km in phase 4.

The analysis of hunting indicator distribution however, shows that in all phases, there are areas with higher rates of attacks. In phase 4, these areas are mainly located around the lake. In all three phases, the research area shows a very low rate of hunting indicators, probably thanks to the regular presence of humans, and to management actions implemented in the park.

Other animals such as apes (24%) and birds (18%) were also observed a lot. But this is not true for elephants (1%), either because there are very few individuals of this species in the park, or because the monitoring method is not useful to assess its ecological attributes.

To finish off, we can see that over the past few years, the encounter rate of duikers has been increasing in the TNP, while indicators of attacks have stabilised or fallen. These results are undoubtfully a result of management decisions that were implemented to protect the “Duiker” value, used here as an example of all animal populations, and to reduce the threats weighing against it. This would hence be a demonstration of the park’s success.