

Project Update: February 2020

In February, 25th 2020, a trip to Kibali Gold Mining (herein - KGM) was planned to investigate the caves and also discuss with the management on ways to plan for long-term monitoring of bat population in the caves that are known to occur in this mining site. We had to be there from 27th February to 15 March.

We arrived on site on 27th February and had the first meeting in the evening of the same day.



Figure 1. A photograph of Prince Kaleme looking for the cave entry at Kibali Gold Mining.

We were given a local team with a car to work with because it is not allowed to use another car that that does not belong to KGM. They has mission to lead us where there are caves or other roosting sites that could be investigated. They should stay until late at night to make sure we have access to all roosting sites. Prospection was done during the day, and equipment left on site where mist netting should take place.

But prior to everything, a meeting was planned with Vital Byabuze, the officer in charge of Environmental affairs of KGM. With Vital, we should discuss all issues related with our work. He had also to give us all the requirements of the company on the conduct on site during our stay.

Activities:

1. The meeting with the management.

2. Discuss our objectives and the requirements of the company, and the conduct on site.
3. Field work.

Meeting with the management:

While we were planning to meet them in office at working time, the meeting took place informally. We met then in the restaurant and when Vital introduced us, it turned out that the discussion was short and, since they were aware of our visit, everything was discussed and the green light was given for us to start the following day.

In the morning of the following day, we were given a briefing of the environment policy of the company.



During the discussion with KGM management in the restaurant (KP - left).

Kibali Rand Gold has a Biodiversity Policy that was adopted by the Board on the 5th August 2012. The bat assessment was of interest to the KGM's commitment to protect and proactively manage the mine activities' impact on biodiversity. The specific points of the biodiversity policy relative to this work are the following:

- Always consider ecological impacts and opportunities for ecological enhancement for any new project or expansion.
- Conduct regular biodiversity assessments at all operating mines.

Prior to starting the work, there were some *a priori* that needed to be met:

1. The first step was to discuss the need of KGM to collaborate with us for the bat work.
2. The second step was to make sure the team had to be under appropriate health and safety protocols and to conduct (with the responsible of SHE and the exploration team) external inspections of all known shaft openings, open pit mining, etc. that could be used as bats roosts. Some mine was inspected because they have caves that the bats use as alternative roosts.

Meeting to workout methods:

We started to discuss the methods with the team given to us the following day. There were four KGM staff members (three gents and one lady) with the two of us (Prince and Jacques Mwanga). We were not allowed to go out of the concession for security reasons. It is also not allowed to bring peoples not formally invited by the management based at Kinshasa (so, we could not bring local students). The team had to learn to set us nets and bat detectors (SM4), how to take notes, explanation of the sheet when an individual bat is in the net. Each of them was given gloves and masks to use when we start mist netting.

Fieldwork:

We had two days to explore the entire concession to visit caves, shafts and other places bats could roost or where we could set mist nets. After the two days, the trapping session should start. The mist netting session started by a demonstration on - setting up a mist net, catching a bat, how to remove it from the net and what measurements should be taken after capture. During free time of the day, they needed to learn on ecology and handling of bats.

Table 1. List of the sites visited.

Location	State/ description
KB 1	Main opening - closed with a tissue - opened every sun set to trap bats that to be taken to the new location. But closed afterward at 10.00 pm to avoid bats entering after foraging early morning.
KB 2	This issue was found blocked following the work that was performed to open the road.
KB 3	This issue was also found blocked following the work that was performed to open the road to the upper site that would the next site to extract gold.
KB 4	Gurumbwa opening was flooded some days ago and the water was removed using moto pumps. At this time, it was empty.
KB 5	Became inaccessible by car due to the work in the area. Following information from KGM worker, it was also blocked by the heavy machinery that has been performing transformation work to make the site ready for mining.
KB 6	This issue (second entry of the cave) was closed every night to prevent bats to enter foraging.
KB 7	This issue was still open but was closed every night (10.30 pm) to prevent bats to enter foraging.

Note: One could think that there were many caves, but it seems there was only one or a few of them, but interconnected inside and has many openings from outside, which were considered by some as being many caves.

Results:

Information showed that potentially (from literature), 111 bats species could be found at KGM, whereas it was confirmed the presence of the following species utilizing the Durba mine tunnels and immediate surroundings: *Hipposideros ruber*, *H. caffer*, *H. gigas*, *Miniopterus fraterculus*, *M. inflatus*, *Rousettus aegyptiacus*, *Rhinolophus eloquens*, and *R. landeri*. This has highlighted the importance of the site for bat conservation. The number may be higher since the monitoring team of the Environmental section only uses camera traps for monitoring large mammals. Small mammals, especially bats are not known from the site.

During the mist netting, many females of Egyptian Rousette (*Rousettus angolensis*) were carrying newborn babies.

Of the species recorded, one is Vulnerable, three are data deficient and two are near threatened.

Table 2. List of the recorded species.

Species Name	Common Name**	Conservation Status**
<i>Chaerephon aloysiabaudiae</i>	Duke of Abruzzi's Wrinkle-lipped Bat	Least Concern
<i>Chaerephon chapini</i>	Long-crested Free-tailed Bat	Least Concern
<i>Chaerephon nigeriae</i>	Nigerian Free-tailed Bat	Least Concern
<i>Chaerephon pumilus</i>	Little Free-tailed Bat	Least Concern
<i>Eidolon helvum</i>	African Straw-coloured Bat	Near Threatened
<i>Epomophorus labiatus</i>	Ethiopian Epauletted Fruit Bat	Least Concern
<i>Epomops franqueti</i>	Franquet's Epauletted Fruit Bat	Least Concern
<i>Glauconycteris humeralis</i>	Allen's Spotted Bat	Data Deficient
<i>Glauconycteris variegata</i>	Variegated Butterfly Bat	Least Concern
<i>Hipposideros abae</i>	Aba Roundleaf Bat	Least Concern
<i>Hipposideros beatus</i>	Benito Roundleaf Bat	Least Concern
<i>Hipposideros caffer</i>	Sundevall's Roundleaf Bat	Least Concern
<i>Hipposideros cyclops</i>	Cyclops Roundleaf Bat	Least Concern
<i>Hipposideros ruber</i>	Noack's Roundleaf Bat	Least Concern
<i>Hypsignathus monstrosus</i>	Hammer-headed Fruit Bat	Least Concern
<i>Lavia frons</i>	Yellow-winged Bat	Least Concern
<i>Lissonycteris angolensis</i>	Angola Fruit Bat	Least Concern
<i>Micropteropus pusillus</i>	Peter's Dwarf Epauletted Fruit Bat	Least Concern
<i>Mimetillus moloneyi</i>	Moloney's Flat-headed Bat	Least Concern
<i>Miniopterus fraterculus</i>	Lesser Long-fingered Bat	Least Concern
<i>Mops brachyptera</i>	Sierra Leone Mops Bat	Least Concern
<i>Mops condylurus</i>	Angolan Mops Bat	Least Concern
<i>Mops demonstrator</i>	Mongalla Mops Bat	Least Concern
<i>Myopterus daubentonii</i>	Daubenton's Free-tailed Bat	Data Deficient

<i>Myopterus whitleyi</i>	Bini Free-tailed Bat	Least Concern
<i>Myotis welwitschii</i>	Welwitsch's Mouse-eared Bat	Least Concern
<i>Neoromicia guineensis</i>	Guinean Pipistrelle Bat	Least Concern
<i>Neoromicia rendalli</i>	Rendall's Serotine	Least Concern
<i>Nycteris intermedia</i>	Intermediate Slit-faced Bat	Least Concern
<i>Nycteris major</i>	Dja Slit-faced Bat	Data Deficient
<i>Otomops martiensseni</i>	Large-eared Free-tailed Bat	Near Threatened
<i>Pipistrellus crassulus</i>	Broad-headed Pipistrelle	Least Concern
<i>Pipistrellus hesperidus</i>	African Pipistrelle	Least Concern
<i>Pipistrellus nanulus</i>	Tiny Pipistrelle	Least Concern
<i>Pipistrellus rusticus</i>	Rusty Pipistrelle Bat	Least Concern
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	Least Concern
<i>Rhinolophus eloquens</i>	Eloquent Horseshoe Bat	Least Concern
<i>Rhinolophus ruwenzorii</i>	Ruwenzori Horseshoe Bat	Vulnerable
<i>Rousettus aegyptiacus</i>	Egyptian Fruit Bat	Least Concern

This list is far from complete because the work was performed in a very short time period. If we had more time, it is possible that we could have more species. We hope to have more time during the next session on this site and catch more species. No voucher specimen was collected here following the agreement with the management. But during the next trip, they said they would request a written permission from the management at Kinshasa to allow us to collect some voucher specimens for laboratory work and also collect some tissue for molecular work. But as tissue, we collected some wing membrane and photographs of the individuals that could be used for molecular analyses.

It is known that this part is home for many species but lacks scientific investigations on bats and many small mammals, most of which might be new to science. This shows the importance of incorporating all the methods to investigate biodiversity occurrence on site and the neighbouring areas.



Left: Removing bats from the mist net using special gloves from the net. Right: An individual of Long-fingered Bat captured being and a head lamp to have a good view of the individuals released.



Females the Egyptian Fruit Bats (*Rousettus aegyptiacus*) carrying newly born babies released after the photograph.



Bats roosting in a shaft.



Left: At a cave entry: PK with a mining worker. Right: On the way back from setting nets in the mine.



Left: Inspection of caves with the KGM team. Right: Jacques and the KGM assistants in front of a cave. Mwanga (second left) and Prince (right).



Our team with KGM key stake holders during security assessment at different caves (PK - second left).



Jacques Mwanga (left) with the KGM assistants. The lady wearing the blue hat. The cave entry is blocked to avoid bats leaving in many openings.