

Project Update: May 2022

Establishing plots and acoustic monitoring points.

28 potential sites around the biggest forest section in Lot 6 of the LKWS were selected for this study. Site visits were conducted during June and July 2021 to ensure the safe accessibility of the sites. This survey established the presence of a number of crocodile breeding sites and resulted in us omitting five sites due to safety concerns. 23 acoustic monitoring points were established together with access trails leading to each monitoring point. In addition, a 250 x 250 m plot was established within each of the monitoring points for the hornbill natural resources survey. In each plot, an M-shape trail was also established as the transect for this survey.

Natural resources surveys.

Surveys at each plot was conducted by three observers using systematic sampling techniques and were only conducted during non-rainy days to reduce bias in detection. A detection event was defined as a visual sighting of a cavity-bearing tree that is suitable for hornbills, and a fig tree. Observers were equipped with binoculars (Levenhuk Karma PLUS, 8.42) to aid with the surveys. Observers walked down an M-shape transect (~1.1 km distance) once at each plot, at the same pace. In total, the observers walked ~25.3 km and detected three trees with cavities and 72 fig trees. Each tree was marked, GPS tagged, and revisited for phenology surveys during the study later.



Comparison of traditional survey and acoustic monitoring.

Surveys at each monitoring point were conducted by two trained observers for 20 minutes at any time from 06.30 to 09.00. Surveys were also conducted on non-rainy days with a clear sky to minimise the effect of weather in detecting hornbill presence. A detection event was defined as the presence of hornbills by visual and/or aural and the exact time of each detection was recorded.

Throughout the duration of the survey, an automatic recording unit (ARU) was placed by the observers approximately 2 m above the ground. Each was configured to record continuously from 06.30 to 09.00 to capture any hornbill calls in parallel to the traditional survey that was taking place. ARUs used for this study were the AudioMoth Dev recorders and they were programmed with the sample rate of 48 kHz on the medium gain with 16 bit-depths. The audio samples were recorded as .wav files onto an SD card. This 48 kHz sample rate enabled the collection of hornbill calls, which fall within this frequency range, and the 16-bit-depth enabled the frequency information gathered to be converted for high-quality audio analysis. One ARU unit was deployed at each monitoring station at which the survey was conducted. In addition to that, ARUs were also deployed at monitoring stations that were north, south, east, and west of the central location where the survey was conducted. This helped to ensure that each detection was monitored independently.

Phenology surveys.

Phenology surveys were conducted by two observers to document the fruiting season of the fig trees in the area. Upon completing the phenology survey of all 25 plots, two fig trees were found to be producing fruits which allowed us to identify them to species level. The remaining fig trees were only found to be producing flowers or new shoots during the time when the traditional surveys took place.