

Project Update: March 2020

My first season of field work was conducted in late-February to early-March 2020 in Tapir Mountain Nature Reserve (TMNR), Belize. University of Southampton team member Dr Jake Snaddon assisted me in fieldwork, along with his PhD student Lydia Katsis. We conducted the following activities:

1. In meetings facilitated by Jake Snaddon, I met with directors of TMNR co-managers: local NGO Karst Habitat Conservation (Aaron Juan and Giovanni Martínez) and the Forestry Department of Belize (Saul Cruz), and director of NGO Wildtracks (Zoe Walker). These meetings were designed to strengthen our links with the conservation community of Belize, and to invite members of these organisations to our on-site AudioMoth workshop planned for our second stage of field work.
2. In fieldwork, we sought accessible routes through the TMNR forest for setting out our permanent grid of AudioMoth acoustic sensors. To this end, we explored the western part of TMNR, and southwards from our current deployment in the northern corner of TMNR. We deployed seven new sensors within the designated grid (Fig. 1), and three supplementary sensors in areas of TMNR that exhibited evidence of frequent hunting (Fig. 2). Accessibility in the reserve proved harder than in our previous experience of the northern corner, when trying to reach optimal deployment locations on hilltops. We continue to liaise with TMNR co-managers and rangers, in order to find accessible routes to optimal locations for our next field work season.



Figure 1. AudioMoth acoustic sensor inside its protective case deployed in Tapir Mountain Nature Reserve.



Figure 2. Evidence of an illegal hunting encampment in Tapir Mountain Nature Reserve. The skull belongs to a white lipped peccary.

3. We conducted field tests inside the forest on the availability of GPS signals, and the functionality of the GPS module currently in development as an attachment to AudioMoths (Fig. 3). This module is designed to synchronise all AudioMoth clocks, in order to allow localisation of a gunshot by the method of hyperbolic navigation – based on time-lags between devices in detection of the gunshot audio-signal. We encountered humidity-related issues whilst testing these devices, which caused several malfunctions. This is a rectifiable problem, which we are confident of being able to address with improvements to the sensor housing.



Figure 3. AudioMoth acoustic loggers coupled with GPS modules, here testing satellite signal capture.

Changes to budget:

1. *Travel arrangements:* Travel between my base at the University of Southampton UK and the field site in Belize was achieved by routing through Mexico instead of a direct UK-Belize flight. At the time of receiving the 2nd Rufford Small Grant (late January) I was in Mexico City due to family reasons. Given the imminent start of my first fieldwork season on the Rufford grant, I travelled directly to Belize from Mexico. This journey involved a domestic flight from Mexico City to Cancun, then a national bus from Cancun to Belize City. On the way back, I travelled on a local Belizean bus from Belize City to Chetumal. From Chetumal, I took a domestic flight to Mexico City. The price for the combined plane tickets Chetumal / Cancun to Mexico City plus Mexico City to London is no more than the originally budgeted London to Belize City roundtrip flight.
2. *Equipment purchase:* The 45 lantern batteries for AudioMoth acoustic sensors were purchased in Mexico instead of the UK, at the considerably cheaper price of ~£300, compared to the original budget of £1,125. I picked them up in Cancun, which meant that I could avoid potential issues with carrying batteries in flight luggage.

I left Belize on the 7th March, a week before Belize began to take measures to control cross-border and in-country travel in response to the coronavirus outbreak. I am working with colleagues in Belize to keep open options for the second field season as much as possible.