Project Update: August 2018

Objective 1: To explore farmers' perceptions toward crop feeding behaviour by white-faced monkeys, the species importance and conservation.

The fieldwork was conducted in the communities of Cañas Gordas, Plaza Caisán and Dominical, located in Renacimiento District, Chiriqui Province, Panama. We conducted personal interviews with farmers from April to July 2018 (Figure 1). Interviewees were chosen using chain referral method (Bernard, 2011) and included those farmers who sow maize in areas adjacent to native forests. Respondents were interviewed using free listing exercises and open-ended questions (Riley, 2007). Questions were constructed to include four sections: (1) socio-demographic information (e.g., age, education level); (2) data referring to the production of corn; (3) knowledge of wild animals that feed corn; and (4) perception about the behaviour of white-faced monkeys in the maize fields.

Figure 1. Interviews with farmers in Cañas Gordas, Plaza Caisán and Dominical.

To date we interviewed 21 farmers who planted maize adjacent to forests and who included in their free lists the white-faced monkey as a species that feeds on their crops. Within this group of farmers, 16 shared their perceptions about monkeys' behaviour during crop feeding events.

Objective 2: To analyse crop feeding behaviour of *C. imitator* in terms of frequency, timing, duration and location of crop feeding events, and the amount of corn consume by white-faced monkeys.

Between June and July 2018 we carried out the first camera trapping campaign in in two maize fields located in the Caisán River Watershed in Chiriquí Province, Panama. We identified the maize fields as BP (2.59 ha, Figure 2) and PP (1.79 ha, Figure 3). In each maize field, seven to eight Cuddeback Black Flash and Long Range IR cameras were set continually from day 75 to day 116 of the reproductive

stage of maize. Based on sampling methods previously conducted by the project team (Loría et al., 2016), we placed camera traps on the forest-farm ecotone, specifically, in places with trunks that facilitate the entry of animals. Each camera was programmed to work 24 hours per day and to capture three images per trigger with interval of 5 seconds between triggers.

Figure 2. Map of BP maize field indicating camera traps location.

Figure 3. Map of PP maize field indicating camera traps location.

The camera trapping in BP field was affected by a tropical storm in June 2018, causing the fall of maize plants and the forest trees. In this site, cameras were not removed and kept operating until maturity stage of maize. The cameras in PP were removed due to the request of the owners who withdrew their willingness to collaborate in the project. Due to these drawbacks direct observation of behaviour were not carried out.

A total of 64 independent events were registered for six mammal species in BP maize field: the white-nosed coati (*Nasua narica*), the red-tailed squirrel (*Sciurus granatensis*), rabbit (*Sylvilagus gabbi*), the common opossum (*Didelphis marsupialis*), ocelot (*Leopardus pardalis*) and the striped hog-nosed skunk (*Conepatus semistriatus*). Of these species, *N. narica* and *S. granatensis* fed corn. No records were obtained for white-faced monkeys.

Due to fieldwork limitations previously described, we included the community of Majagua Civil as a new study site, which is located in Barú District (Figure 4). Between July and August 2018, three Cuddeback Black Flash and Long Range IR cameras were set continually from day 69 to day 110 of the reproductive stage of maize. Following the methods conducted in Caisán, we placed camera traps on the forest-farm ecotone, in places with trunks that facilitate the entry of animals. Each camera was programmed to work 24 hours per day and to capture two images followed by a 30 second video per trigger, and the time lapse between triggers was a 5 second interval. Based on Wallace & Hill (2012), we defined a crop feeding event as a situation when one or more white-faced monkeys enter a maize plot, interact with one or more maize stems, and leave the plot. Crop feeding events will be considered independent if one hour has passed between photographs where the last monkey leave the plot (Gómez et al., 2005; Zak & Riley, 2016).
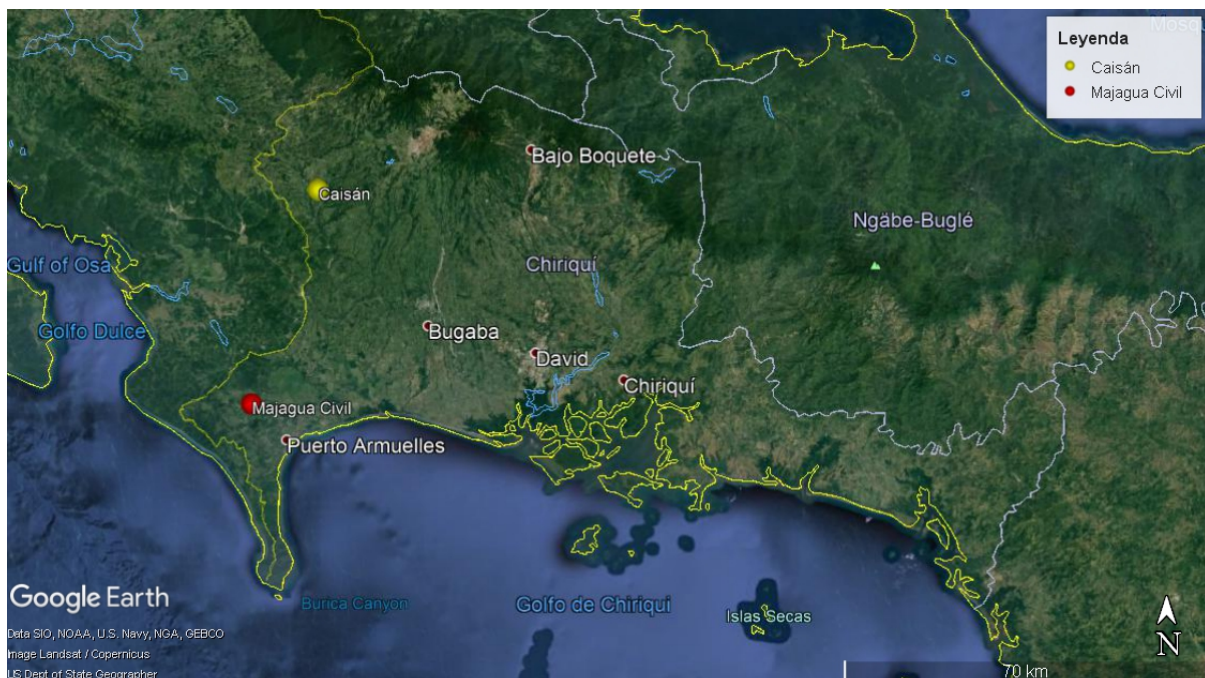

Figure 4. Location of Majagua Civil in Chiriquí Province.

A total of 14 independent events were registered in Majagua Civil for white-faced monkeys (Figure 5). Crop feeding events occurred in the afternoon (mean time 13:45 ±SD 1:32 hours).

Figure 5. Crop feeding event recorded by a camera trap located in Majagua Civil.

References

Bernard, H. R., 2011. *Research Methods in Anthropology: Qualitative and Quantitative Approaches.* Fifth ed. Oxford: Altamira Press.

Gómez, H., Wallace, R., Ayala, G. & Tejada, R., 2005. Dry season activity periods of some Amazonian mammals. *Studies on Neotropical Fauna and Environment,* 40(2), pp. 91-95.

Loría, L. I., Esquivel, G., Morán, K. & Méndez-Carvajal, P. G., 2016. *Preliminary observations of crop-raiding by white-faced monkeys in an agricultural landscape, Chiriqui province, Panama.* Belize, s.n., p. 10.

Riley, E. P., 2007. Flexibility in Diet and Activity Patterns of Macaca tonkeana in Response to Anthropogenic Habitat Alteration. *International Journal of Primatologists,* 28(1), pp. 107-133.

Wallace, G. & Hill, C., 2012. Crop Damage by Primates: Quantifying the Key Parameters of Crop-Raiding Events. *PLoS ONE,* 7(10), p. e46636.

Zak, A. A. & Riley, E. P., 2016. Comparing the Use of Camera Traps and Farmer Reports to Study Crop Feeding Behavior of Moor Macaques (Macaca maura). *Internationa Journal of Primatologist,* Volumen 38, pp. 224-242.