

Project Update: August 2017

Project summary

Crossodactylodes itambe belongs to a rare group of frogs living on highlands of Atlantic Rainforest and are strictly dependent on bromeliads. Species lives in a single location and estimated area of occurrence is less than 0.5 km². Although fully located in a protected area, a recent fire destroyed more than half of species habitat and the only known population can now be facing a severe decline. We aim to evaluate the effects of fire on the dynamics of this threatened population using continuous monitoring data from before and after the fire event. We are also looking at solutions that can make monitoring less costly and will test the novel method of Environmental DNA to detect species at a site.

For this project, our activities were described in four main actions: field work, data analysis, reporting results and capacity building. Herein we describe activities developed in the past three months of project during field work.



Activities Developed For Field Work

- Licences and permits were sorted and we have all legal documents to survey species and work in the protected area, including risk assessments and ethical forms.
- Study area was photographed to register the damage that fire caused on the study area. We had bromeliads marked with a numbered tag from low to high elevation, which were being monitored since 2014 – on these sites frogs were surveyed to record species presence/absence. Most bromeliads from the lowlands were affected by the fire (80% of tagged bromeliads), destroying the structure of the plant. Bromeliads in higher elevations were mostly preserved (only 10 out of 93 were affected by fire).
- We changed tags for new numbers and continue the survey in the affected plant.



- For occupancy surveys, we deployed the same cost-effective sampling design that was first suggested in 2014 (which was developed during previously funded project). In April 2017 we did field work of 5 days in our study area to sample data on species occupancy and detectability. We surveyed 143 sites at night, using visual encounters. We recorded total number of adults, tadpoles and juveniles occurring at each plant. This activity is now concluded as initially described in the project, and data will be compared to previous years for species monitoring and evaluating the impacts of fire.
- In May 2017 we did a long field expedition to visit surrounding mountain tops that were indicated in the species distribution model (data for this analysis was sampled in 2015 during previously funded project). Our main goal was to find a new population of the frog. Our proposal initially suggested that at least two areas should be investigated, but we surveyed four mountain tops indicated by the model. This activity was successfully concluded, with more sampled areas than we first expected.
- We found the bromeliads in all areas we visited: Pico Dois Irmãos (1), Serra Negra, Serra Menina (2) and Serra do Ambrósio.



We found a new population!



- We found only one population at Serra Negra State Park; a protected area about 64 km from our study area and species original distribution. However, we still need taxonomic confirmation of the record and we are now working on a DNA analysis to compare species from the two localities (original and new population). This should be finished within a month.
- Bromeliads occupied by individuals at Serra Negra are quite different from the ones used by frogs at Itambe summit. Although bromeliads are *Vriesea* sp. (same genus as the ones recorded in our study area), they are arboreal species located inside the forest.



- In June 2017 we also did a 4-day field trip to the study area to sample water and test eDNA method. Unfortunately, due to logistic issues with importation of laboratorial supplies and materials, we were able to take only nine water samples. We initially estimated to get 30 samples, so this activity is considered incomplete. We are discussing the feasibility of getting the additional samples next year, during the next wet season.
- Extraction of water samples for eDNA analysis was successful. We first prepared a labeled extraction kit containing all supplies needed (1), which were numbered according to labeled tag. We then removed 160 ml of water from the bromeliad (2) and empty the content of water in a special filter (3). Samples were kept in ethanol within labeled containers to avoid any contamination (4).



1. Data analysis
 - Occupancy models: compare the effects of fire before and after fire event (4-5 months).
 - Distribution models: validate the record of new population and produce distribution maps (2 months).
 - eDNA: extract DNA from water samples collected this year; plan to get more samples next year (7 months).
2. Capacity building (March 2017)
3. Reporting results
 - Publications: produce papers and notes.
 - Communicate results: attend conferences and give talks (8 months).
 - Contribute to IUCN species assessment (2 months).
 - Final report (April 2017).

