

Project Update: January 2015

Experiences at the *Peltophryne fluviatica* type locality.

Eleven visits have been made to the type locality of the target species. However, to date, no evidence of the species has been found despite the fact that we documented breeding activity in its relative *P. guentheri* on several occasions: choruses, tadpoles, metamorphs and juveniles of that species have been observed at the site, though we observed fewer breeding episodes compared with the other two study sites, Arroyo Bellaco and Río Maguana. It is worth noting that Río Gurabo's levels and flow have been quite variable since our first scouting visit in March 2014. The river bed has been dry at several occasions at the type locality.

During our last trip, in December 2014, we visited both the river spring at its highest elevation as well as at its confluence with the main river of the Valle del Cibao, the Yaque del Norte River. Río Gurabo comes out from the foothill of a slim plateau located approximately 13 km south-southeast from the type locality, and lies around the 450 m asl.

Radio-tracking *Peltophryne guentheri*.

We mounted Holohil BD-2 transmitters to three individuals during fieldwork. Although the sample size is small, this constitutes the first information available of follow-up spatial data and habitat use of any native toad species in Hispaniola. The results suggest the possibility of a pattern in the use of habitats. Out of the three monitored individuals, two were females, and one male. The male used the river bank (underneath leaves and palustrine vegetation) as diurnal retreat when a chorus event was taking place on the previous night in Río Gurabo. Two days later this male moved out of the river area and was found hiding in a burrow (probably of its own manufacture) in a grass field that was cleared from natural forest earlier this year.



Ranger Palmenio (Ruben) during training in the radio telemetry technique at Rio Gurabo

One of the two radio-tracked females was recovered at a small farm near a few scattered and isolated houses in the Río Maguana study site. This female eventually went out of the range of our signal detectors, and we were unable to locate this individual despite an exhaustive search within a 2 km radius of her locality 2 weeks after the first encounter. The signal of the remaining female was perceived strongly in another grass field that was being irrigated. This female was captured at the shore of Río Gurabo.

Hispaniolan *Peltophyryne* toads under ex-situ conditions.

Our contributions have also been the first to include Hispaniolan native toads into an ex-situ, controlled environment. Previously, the programme at the national zoo's (ZOODOM) facilities only hosted treefrogs (Hylidae) and a few land frog species of the genus *Eleutherodactylus*. This provided a new opportunity to the keepers to gain experience with members of the Family Bufonidae. For example, the only tadpoles formerly raised at the zoo were those of the tree frogs, which are well adapted to climbing vertical surfaces. Following our advice from field experiences, they intentionally placed stones into the water recipients so that the recently emerged toad metamorphs could remain safe from drowning.



Evelin Gabot feeding toadlets at ZOODOM

Given that most hylid frogs are montane species, their tadpoles do well in cool temperatures. This was not expected for the toads, which are often found in low, semi-arid areas. Using our field data from

loggers (temperature and relative humidity), the zoo staff individually placed bulbs in toad enclosures in order to locally increase temperature.

Sixty toadlets of the new toad species we encountered in the southernmost of all study sites (Pedernales) survive to date (E. Gabot pers. comm.). These were raised from the larval stage, and are now in size ranges of 15-21 mm, giving us the opportunity to document ontogenetic changes in morphological and chromatic characters. The largest individuals (20-21 mm) are starting to show some green coloration, whereas the metamorphs and smaller toadlets are mostly black with large white and salmon blotches. Cranial crests and the acuminate snout tip (in profile) are beginning to be defined.



MALT measuring toadlets at ZOODOM

An adult female of another threatened toad species, *Peltophryne fracta*, was found by a local collaborator (villager Hector Rijo), who to our surprise, was able to recognise the species in the field. Mr Rijo found the animal under a leaking tap that comes out from a large water tank at his backyard. He informed us that he frequently see these toads there. This species was "lost" to herpetologists from 1978 to 2011, and nothing is known about their non-breeding activities. The female is being kept alive at the ZOODOM until males can be found, likely during a next breeding event. This toad appear to have a short breeding season, recorded only from June to August, and according to the literature, it is very difficult to locate individuals outside of this season. The species is restricted to the far east of the country, within a very small range that is dominated by cattle farms and urban development.

Finally, four adult individuals of *Peltophryne guentheri* were brought to the facilities at ZOODOM: three males and one female, and they are all doing well. After quarantine process, it is recommended to pay special attention to these in order to look for any reproductive intention. This is the most common and widespread of all Hispaniolan *Peltophryne*, hence it offers good opportunities to learn more on their reproductive behavior, but no breeding activity has been noted. A limitation for this is the lack of available personnel at night hours in order to observe the toads when they would normally become active.

Educational activities.

In last fall, we conducted a total of three talks on the project, two of these in October 2014 were set at the village next to the study site of the target species, Los Quemados, 3 km east of Río Gurabo in the road that connects Mao with Santiago Rodriguez. One of the appointments at the Centro de Madres of the same village was affected by weather conditions, due a cold front that caused high levels of rainfall, hence not favouring local attendance. However, despite heavy rain, we hosted more than 30 local guests, and invited them to a picnic table. With the help and coordination of local farmer and teacher Miguel Peralta, another talk was scheduled two days later at the school of the same village, which hosted 65 students from primary school. Something we learned during these travels is that is mandatory to acquire a portable projector in order to conduct consecutive talks in some fairly remote areas, during long field journeys to avoid high charges when renting one.

A promotional poster is being designed which contains the most representative vertebrate species of the protected area Refugio de Vida Silvestre Cañón (Furnia) del Río Gurabo. We plan to print 50-100 copies, and deliver the design to the Ministry of Environment so they can print more as they wish.

An introductory workshop of two sessions on ecology and taxonomy (for identification) of the anurans found in the protected area was finished in November 2014. It included a practical instruction in the use of the radio-telemetry gear, and gave the rangers a direct contact with that technique while in the field looking for an actual, currently radio-tracked toad.



Left: MALT & ROA performing a talk at Los Quemados school. Right: ROA & MALT along teachers and directress of Los Quesada's' School.

Conservation involvement.

Part of the resulting contributions of this project is to have an overview of the status of all *Peltophryne* species in the island, as well as to help addressing the problems these species and their habitats may be facing (current, and historical if possible). During our expeditions outside main study sites, we witnessed the destruction of a large proportion of forest within a protected area where the new toad species was found. We documented this illegal habitat destruction photographically and spatially (with GIS) and collaborated with local's individuals, local organizations, and the media to denounce this activity. As a result of our efforts, the government official responsible for this act, the Provincial Director of Environment of Pedernales was relieved from his charge. The forest clearing stopped, but a considerable portion of the only site we know for this new species was already destroyed (the three first individuals found were close to the burning logs).

Newspaper and other media coverage:

http://www.diariolibre.com/ecos/2015/01/15/i968561_encuentran-nueva-especie-sapo-sierra-bahoruco.html

<http://www.noticiassin.com/2014/12/patricia-solano-depredan-sierra-de-bahoruco/>

<http://www.birdlife.org/americas/news/persistent-tragedy-sierra-de-bahoruco-case-las-mercedes>

http://www.diariolibre.com/ecos/2014/11/25/i897071_permiso-que-deforest.html

http://www.diariolibre.com/ecos/2014/11/27/i901791_investigacion-quema-tareas-pedernales.html

http://www.diariolibre.com/ecos/2014/11/24/i896051_medio-ambiente-suspende-funcionarios-curso-investigacion.html

http://www.diariolibre.com/noticias/2014/12/04/i911641_medio-ambiente-destituye-director-provincial-pedernales-tras-quema-terrenos.html

<https://www.facebook.com/SalvemosLaSierraDeBahoruco>

More generally, our work on this project has attracted international media attention. In January 2015, journalist Jennie E. Smith published an article describing our project and many of our important findings in *The New Yorker*:

<http://www.newyorker.com/tech/elements/hispaniola-mystery-toad>

Ms. Smith has been invited to collaborate with our project, and she has visited us in two occasions, covering our quests of elusive species, as well as the natural history information we obtain in the field. This article is the first one in a developing series by this renowned environmental journalist. We are hopeful that articles such as these will raise awareness of the need for species conservation in the Dominican Republic.

Survey results.

Our presence in the northwestern region of the Dominican Republic helped us to become more familiar with weather patterns. The qualitative data collected by rangers at the station of the Refugio de Vida Silvestre Cañón (Furnia) del Río Gurabo shows a pattern of afternoon rains, but not for prolonged periods except when cold fronts move through in the Fall months. Almost all of the toad captures at pitfall traps happened during and around rainfall days. Interestingly, only juveniles of *P. guentheri* were found in the traps. The fact that we keep finding metamorphs and toadlets along the river shoreline at sites where tadpoles complete metamorphosis, and then larger individuals are eventually found in the adjacent gallery forest, suggest that the foraging habitats of adults and juveniles may be partitioned. This seems to be corroborated by the few adults relocated with the use of radio transmitters, and that

no adults have been found at traps in spite of being in breeding activity not far from the traps. However, more data is required in order to test these preliminary observations.

Although in the northwest we are focused on the riparian habitat, we opportunistically surveyed along a dirt road that connects Rio Maguana with the town of Santiago Rodriguez. Given that favourable weather conditions appeared by October 2014, we noticed that toads (*P. guentheri*) also used cattle ponds in the farmlands. In fact, the largest choruses were detected in such type of situations. There were times that even during rainy days, none or poor breeding activity was found in the rivers, whereas they were intense at still water bodies such as cattle drinking ponds and reservoirs.

The type locality of *P. fluviatica* (Río Gurabo) bears the same amphibian community that the discoverers of the species reported more than four decades ago. Some differences can be noticed from our field experience and our irregular presence in the area since 2009. We are adding one species, the Hispaniolan giant treefrog (*Osteopilus vastus*) to the anuran fauna of the type locality, as well as other species that we found in the same river at its highest elevations.

At southwestern localities, in the Valle de Neiba (Independencia Province), we have been following the breeding activity of a subpopulation in an odd anthropogenic microhabitat: a gutter of a street sidewalk in a town surrounding Lago Enriquillo. The gutter has shallow water but it is continuously flowing from a leaking pipeline system, creating stable and apparently suitable conditions for *P. guentheri* to breed.

What's next?

All the above provide new information on how Dominican toad populations are likely structured habitat-wise. Some ethological and ecological data needs to be pursued in order to test any early hypothesis that is produced by our preliminary surveys. As our field trips have ended, we are preparing materials for dissemination of the information we have gathered, including several scientific notes and articles.

Marking and recapture will have to be continued, including in additional habitats (cattle ponds, lagoons, reservoirs). In the same sense, sample size for radio-tracking and chytrid fungus (Bd) will be increased.

We are very eager to increase our efforts in other areas outside our main study site, since we have now gained experience and knowledge that is potentially useful to be applied elsewhere: Higüey, Pedernales, and Postrer Río are the most promising localities.

Now that we are training the personnel at the main study site (*P. fluviatica*'s type locality), we can eventually select some collaborators so they can extend the surveys locally. Field gear like portable sound recorders, compact cameras and GPS units would allow us to provide trainees, rangers, or volunteers with the equipment and training they need to assist in our efforts.

Experienced Puerto Rican biologist Miguel Canals states that "it takes time to understand these toads", when referring to the Puerto Rican Crested Toad (*Peltophryne lemur*), adding: "many sacrifices are mandatory in order to keep track of them", referring to the long field journeys and persistence required to study them in a long term basis. *Peltophryne lemur* is one of the most endangered Antillean toads, and has been subject to more attention and conservation efforts probably than any other species in the region. Through our work, we hope to bring similar attention to the endangered toads of Hispaniola.