

STATUS SURVEY OF THE YELLOW HARLEQUIN TOAD (*Atelopus carbonerensis*). VENEZUELAN ANDES

Preliminary Report Submitted to Cleveland Zoological Society, Cleveland Metroparks Zoo
& the IUCN/SSC Declining Amphibian Population Task Force

By
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PROJECT ATELOPUS - Fundación AndígenA

Mérida - Venezuela
December 2003



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INTRODUCTION

At the moment, 80% of the survey is already completed. In this report of advance, we present a series of comments and images of the work done.

When we proposed to assess the status of *Atelopus carbonerensis*, an endangered amphibian endemic species of Venezuela, we really expected to find wild populations, or at least scattered individuals in the field. However, the partial results of the field research are not very optimistic.

During last 10 months, I have carried out 6 fieldworks and 54 interviews to local people inhabiting the species range (usually involving each the whole family) in order to raise information about species presence and identify the best places to find it. The interviews allow me to be very optimistic because a significant number of reports pointed recent sights of individuals (statistics and comments will be presented in the final report). However, the general perception of the local inhabitants was the noted disappearance of the species about 15-20 years ago in the region.

The fieldwork was always carried out with the assistance of local guides (“baquianos”) in order to optimize the search effort in the field. In this way, I choose 30-40 years old men with deep knowledge of the places and the *Atelopus* natural history (Fig. 1).



Figure 1. Fernando Dugarte, one of my local guides in the Study Area

The area selection process for the fieldwork began with a literature and cartographic review. This information together the localities referred by the local people, allowed me to choose the best places for the search of the toads in the field. In this way, two principal localities were chosen to explore with more intensity (Fig. 2): 1) *San Luis* (2,000 m. a. s. l.), with a very important undisturbed cloud forest area and 2) *Páramo El Tambor* between 2,400 and 2,800 m, with a landscape of undisturbed cloud forest and páramo habitats (Fig. 3). In both localities several sights of individuals were reported in the near past according to interviews. In fact, in this locality was seen and photographed the last individual of the species according to our historical records. We carried out two fieldworks in *San Luis*, spending more than a week in total, but no results were obtained about *Atelopus* presence. However, we also find other interesting and endangered amphibian species such as *Colostethus meridensis*.

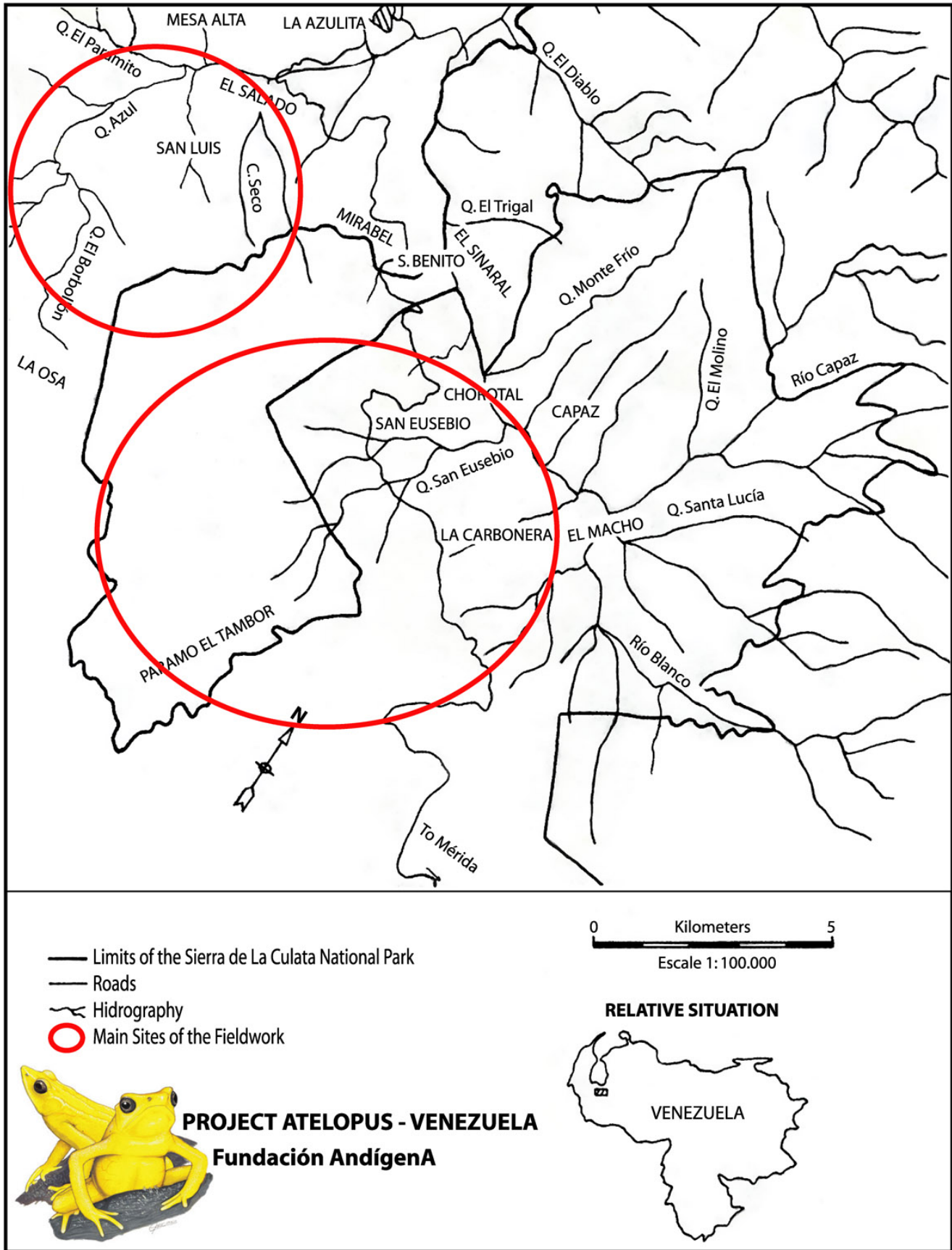


Figure 2. Localization of the Fieldwork



Figure 3. Páramo El Tambor. Sierra de La Culata National Park

In Páramo El Tambor was more certain the possibility to find some individual due this was the locality referred in almost all the reports. However, after walking all suitable places, looking everywhere, under logs, stones and trunks, opening holes, moving forest litter, following creeks, etc., during two more field trips, finally we did not find some individual.

While our partial result about the current presence of *Atelopus carbonerensis* in its original range is not positive, we must wait until the last field trip planned to be held on next January 2004. If the final result is the confirmation of the current absence of the species in the wild, we could think about its possible extinction, although we must be always very cautious about it. Of course, the species population



size is not anymore as it was in the near past. *Atelopus carbonerensis* was very abundant everywhere, crossing roads and dying for thousands... but if some individuals or population still survive, must be located in a very isolated and remote place.

OBJECTIVES OF THE ORIGINAL PROPOSAL

1. To assess the population status of *Atelopus carbonerensis* in their typical localities.

- By means the identification of presence/absence areas.
- Through multivariate analysis.
- Through a series of interviews to the local settlers and field researchers related with fieldwork in the habitat of *A. carbonerensis*.

2. To identify probable threat factors that is causing the disappearance of *Atelopus carbonerensis*.

- By means of a series of interviews to the local settlers and field researchers related with fieldwork in the habitat of *A. carbonerensis*.
- By means of field checkup.

3. To carry out an inventory of the local amphibian fauna associated to the *A. carbonerensis* habitat.

- By means of a systematic fieldwork based only in audiovisual registers (photos, direct sighting, calls, etc.).

4. To develop an environmental awareness campaign focused on *Atelopus* Conservation and the Declining Amphibian phenomenon in the Venezuelan Andes.

- By means the production and distribution of a high quality educational poster.
- By means the use of the regional mass media institutions.

5. Increase the public knowledge and the awareness on the importance of addressing actions in favor of the *Atelopus* species conservation.

- By means the celebration of a public technical workshop addressed to governmental officials and the scientific and conservationist community.
- By means the popularization of the information raised through the fieldwork.

6. To help strengthen environmental organizations of the Venezuelan Andean region, who have the specific objective of the conservation of the Andean fauna.

- By means the celebration of a technical public workshop.
- By means of the creation of a scientific advisory council led by Foundation AndígenA and its partners in the Project Atelopus.

PARTIAL RESULTS

1. A series of interviews to the local people determined potential areas of current presence of the species furthermore information about its natural history (Figs. 4 & 5). We visited each one of these places but we are not able to find any sign of the current species presence. Interviews also were very coincidental in giving a probable date for the beginning of the *Atelopus* disappearance: 1983, when the road from Mérida city to La Azulita village was cemented. This road allowed much more vehicles transit with the associated increment of toads' mortality. Also the use of pesticides for cultivation and deforestation for clear areas for cattle production are understood as possible extinction causes (Fig. 6). However, scientific responses about why the species did not survive in pristine areas, far from the roads, cattle raising areas and cultivations are difficult to present with the available data.

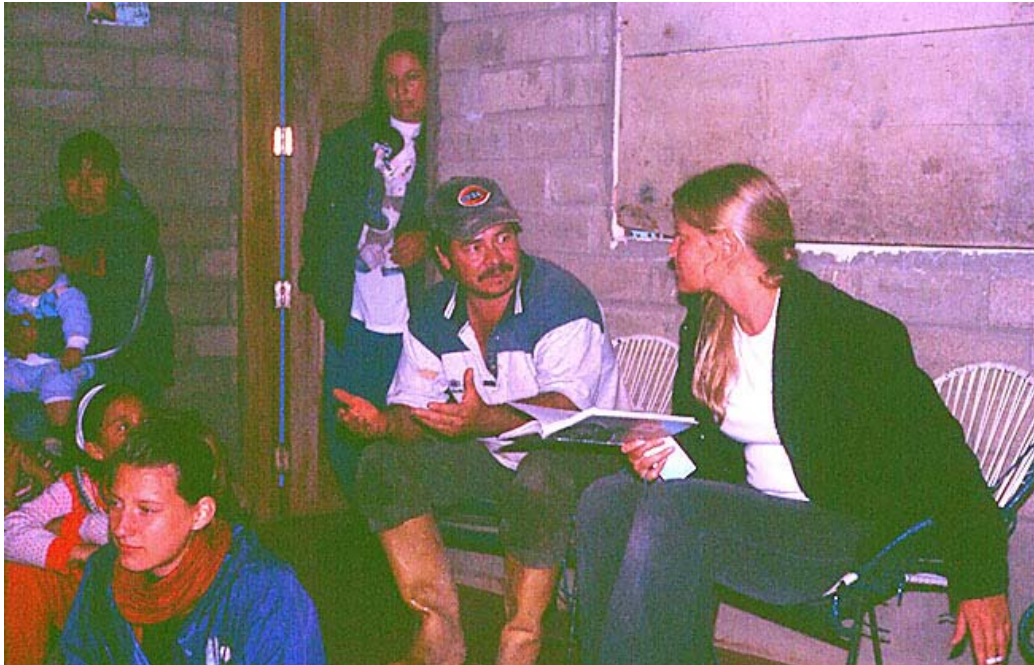


Figure 4. With the assistance of Danish participants of the Foundation AndígenA's Eco-School of Spanish, I could carry out a series of interviews among the local people



Figure 5. César Barrio (in the middle with hat) next to a local guide (left) and the Danish students



Figure 6. Deforestation in the area was detected. This could be considered one of the factors of the *Atelopus* declining.

2. After examining all reasons given by our interviewees besides our direct appreciation, we can deduct some possible factors to explain the *A. carbonerensis* declining and possible extinction. Of the reported hypothetic causes by La Marca and Reinthaler (1991), we must decidedly not count the "destruction of natural habitat", due an ample area of the original habitat still remains undisturbed in the region. "Flooding" can be punctual cause of local deaths in mass, but in the case of *Atelopus*, they occupied area no too close to the streams (Dole & Durant, 1974). "Road kills" are supposedly a main factor that contributed to the declining or extinction of the species, due a great proportion of the reports pointed numerous dead individuals in the roads. But in the same way, other toad populations far from the road should survive. "Overcollection" was apparently an important factor in diminishing the number of *A. carbonerensis*; as is known, this species is the most abundant in the museum collections in Venezuela, with jars full of them. However, a single day of migration and transit by roads could finish with much more animals that all specimens collected during all years together. "Global climatic changes" and alteration rainfall patterns are, at the moment, the most reasonable causes to explain the probable extinction of *A. carbonerensis*. However, we do not have direct proofs to demonstrate this hypothesis due the climatic data available about the region is very faulty.

"Fungus and infections" have been not detected in any amphibian in the area, excluded the recently introduced *Rana catesbeiana*, which lives in ponds and must be not directly involved in any aspect with *Atelopus*. Of course this could be a possible reason to take into account, because has been detected in other countries, as Costa Rica, as the main threat factor of several amphibian species (Lips 1998). "Pollutants" are also plausible reasons to affect directly the species alive. We didn't find amphibian presence in those apparently undisturbed streams near to the cultivations where the farmers use traditionally pesticides and other chemical products. It is beyond our possibilities to assess if acid rains or other travelling pollutants are affecting the regional amphibian fauna. Introduced species in the area are: Rainbow trouts (*Onchorhynchus mykiss*), which lives in large streams and rivers, but seems not to be a main factor to affect *Atelopus*; the Bullfrog, *Rana catesbeiana*, which has been introduced recently, and surely before the decrease of *Atelopus* population size. Furthermore, this exotic species lives in ponds and not in those streams occupied by *Atelopus*. Exotic plants such as *Pinus* sp. *Cupressus* sp. and *Eucaliptus* sp. are present in the area. These species acidify soils modifying the forest substrate, but in the area, just a small patch has been planted. So far, we cannot determine with confidence the cause of extinction of *Atelopus carbonerensis* right now. We have also measurements of pH taken in several

streams and we could compare these data with measurements taken years ago, if this information is available.

3. Beside the search of *Atelopus*, we made an inventory of the local herpetofauna, observing their potential population status, but not making detailed observations. In an altitudinal range from 1,000 m to 2,800 m. a. s. l., we found the following species:

Species	Locality	Altitude	Relative Abundance*
<i>Bolitoglossa spongai</i>	Páramo El Tambor, La Carbonera	2,200-2,800	3
<i>Atelopus carbonerensis</i>	Páramo El Tambor, La Carbonera, San Eusebio, El Chorotal, San Luis, La Azulita	2,200-3,000	6
<i>Hyalinobatrachium durantei</i>	El Chorotal, San Luis	1,500-2,000	2
<i>Centrolene andinum</i>	Quebrada Azul, Quebradón, San Luis	1,400	1
<i>Centrolene venezuelense</i>	Páramo El Tambor	2,500	4
<i>Colostethus meridensis</i>	San Luis	2,000	5
<i>C. mayorgai</i>	La Azulita	1,300	5
<i>Gastrotheca nicefori</i>	San Luis, La Azulita	1,400-1,800	3
<i>Hyla meridensis</i>	La Carbonera, San Eusebio	2,200	1
<i>Hyla platidactyla</i>	El Chorotal	1,600	5
<i>Hyla lascinia</i>	San Luis	1,400	5
<i>Scinax sp.</i>	San Luis	1,400	3
<i>Leptodactylus sp.</i>	San Luis	1,400	2
<i>Eleutherodactylus vanadisae</i>	San Luis	2,000	5
<i>Eleutherodactylus 1</i>	La Carbonera	2,300	5
<i>Eleutherodactylus 2</i>	Páramo El Tambor	2,500	5
<i>Eleutherodactylus 3</i>	La Carbonera	2,300	5
<i>Anadia cf. bitaeniata</i>	Carbonera	2,300	3
<i>Anadia sp.</i>	El Tambor	2,800	3
<i>Atractus taphorni</i>	La Carbonera	2,300	3
<i>Atractus sp.</i>	La Carbonera	1,400-2,300	2
<i>Chironius monticola**</i>	Páramo El Tambor, La Carbonera,	2,000-2,500	3
<i>Lampropeltis triangulum andesiana</i>	La Carbonera, San Eusebio	1800-2200	4
<i>Liophis epinephelus</i>	La Carbonera	2,200	3
<i>Micrurus mipartitus</i>	La Azulita, El Chorotal	1,400-1,800	3

* The term "Abundance" is subjective, and is determined by our direct experience in the field. 1: Very abundant, with lots of specimens and no apparent danger. 2: Abundant. Common in the area, with fewer specimens, but still out of

danger. 3: Present in the area, but with no common encounters. 4: Rare, present but difficult to see or heard. 5: Very rare, Very difficult to see or heard. In: Known by interviews but never seen directly. 6: Possibly extinct. No direct encounters, despite intensive searching.

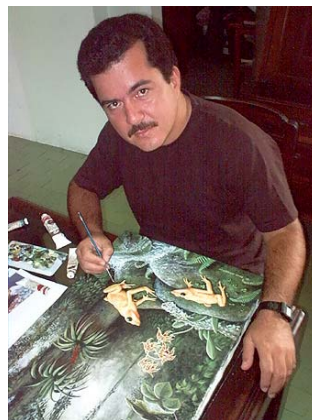
** All interviews known a green racer snake, which has been not seen directly. In the ULA herpetological collection there is not a single green racer coming from that area, and we are not confident about the identification of the species. However, *C. monticola* is the only species that falls well in the description given by local people.

CURRENT EFFORTS

4. Currently we are concentrated in two major aspects of the project: 1) the production of the educational poster, which will be finished before the end of the year and distributed widely after then and 2) the arrangement of a workshop or conference, possibly to be held during January 2004. The final report will be written during February-March 2004 and then sent to the sponsors.

In order to produce a very attractive educational poster, we will use a beautiful painting of the species in its natural habitat made by the Venezuelan wildlife illustrator and naturalist, Roger Manrique (see pictures below).

A detailed paper based on the final report will be sent to a scientific journal (Biological Conservation is the best choice). Two additional papers are planned, one about the status of *Colostethus meridensis*, another endangered species, and the other one about ecological observations on *Bolitoglossa spongai*; in both publications credits to the Atelopus Project's sponsors will be recognized.



Wildlife Illustrator, Roger Manrique making the *A. carbonerensis* painting to be used in the educational poster

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