

# **PANDI MUSHROOM-TONGUE SALAMANDER PROJECT:**

## **CONSERVATION STATUS ASSESSMENT OF A THREATENED ANDEAN SALAMANDER FROM COLOMBIA**



### **PROJECT UPDATE**

#### **SUBMITTED BY**

**GIOVANNI ALBERTO CHAVES PORTILLA**

Fundación Ecodiversidad Colombia

[gchavesp@ecodiversidad.org](mailto:gchavesp@ecodiversidad.org)

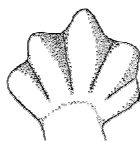
[www.ecodiversidad.org](http://www.ecodiversidad.org)

#### **Co-investigators**

**FABIAN TAVERA BELTRAN**

**OSWALDO CORTES HERRERA**

Fundación Ecodiversidad Colombia



**PANDI  
MUSHROOM-TONGUE  
SALAMANDER PROJECT  
COLOMBIA**



**amphibian ark**



## Introduction

The mushroom-tongue salamander (*Bolitoglossa pandi*) is perhaps the most enigmatic salamander species of Colombia because is only known for two specimens from the municipality of Pandi, which is located in the western slope of the Eastern Andes of Colombia. Currently this endemic species is listed by the IUCN as endangered (EN) because its areal distribution is small, fragmented or fluctuating. Little is known about this salamander, its current distribution, ecology, natural history, and others relevant aspects are basically unknown.

This species was described by Arden H. Brame Jr. and David B. Wake, who in 1963 published a work about the salamanders of South America in which they described six new species of salamanders for the continent including *Bolitoglossa pandi*. The species description was made with only one specimen, an adult female collected by Wilhelm Fritzsche in September 1913, which is currently deposited in the Zoological Hamburg Museum (Germany), in poor conditions of conservation. The other known specimen of this salamander and which is in good conditions was collected by Franz Kanston Flórez and José Ignacio Bernal in 2002 at another place different of the holotype, also in the municipality of Pandi.

Because of this disappointing scenery, it is necessary to ascertain the conservation status of the species in areas with historical records and places with similar properties in the municipality of Pandi, recording significant information about the ecology, biology and history natural of this species, which has been poorly reported; also will be known threats that are facing this amphibian in the assessed areas.

Finally, the implementation of some environmental activities and information will warn to the local communities in these areas on the serious crisis that are facing this and other amphibians worldwide, and the urgent need to protect and safeguard this group of animals for the sake of the nature and the humanity.

<p><b>Project Title:</b>  <i>PANDI MUSHROOM-TONGUE SALAMANDER PROJECT: Conservation Status Assessment of a Threatened Andean Salamander from Colombia</i></p>	<p><b>Planning period:</b>  May 2009 -May 2010</p>	<p><b>Country:</b> Colombia  <b>Prepared:</b> September 2009  <b>Project implement by</b> Fundación Ecodiversidad Colombia</p>	
Summary of objectives/activities	Objectively verifiable indicators (OVIs)	Means/Sources of verification (MOVs)	Important assumptions
<p><b><u>Supergoal</u></b></p> <p>The wildlife of the Sumapaz region in the Cundinamarca department is conserved and their use by the local communities is sustainable.</p>	<p>Sustainable practices are performing for the local community</p> <p>The flora and fauna of the Sumapaz region are protect through the implementation of clear environmental policies and an adequate awareness of the local communities</p>	<p>Final report of the Pandi Mushroom-tongue Salamander Project</p>	
<p><b><u>Project purpose</u></b></p> <p>Performing an assessment about the conservation status of Pandi Mushroom-tongue salamander (<i>Bolitoglossa pandi</i>) that allows collect fundamental information to establish the baseline knowledge of this amphibian.</p>	<p>The species is found in some of the samplings</p> <p>The data about the ecology, geographical distribution and natural history of <i>B. pandi</i> are properly recorded in each of the sampling</p>	<p>Final report of the Pandi Mushroom-tongue Salamander Project</p> <p>Update reports</p> <p>Publications in the scientific journals</p> <p>Report in the website of Fundación Ecodiversidad Colombia</p>	<p>The public order and the security conditions in the study area are the bests and will not change in the near future</p> <p>The permits to have access to the forest fragments are approve by the landowners</p>
<p><b><u>Results</u></b></p> <p>1. The data about the relative abundances, geographical distribution, natural history and other ecological aspects of the Pandi mushroom-tongue salamander (<i>Bolitoglossa pandi</i>) are obtained through samplings developed in the municipality of Pandi and its surroundings.</p>	<p>Presentation of update reports, about the fieldwork to Fundación Ecodiversidad Colombia</p> <p>Field activities performed on time.</p>	<p>Final report of the Pandi Mushroom-tongue Salamander Project</p> <p>Publications in the scientific journals</p>	<p>Similar species to <i>B. pandi</i> have demonstrated a resistance level to the habitat fragmentation, which means that this species may be found in relatively small forest</p>

	The results of this research are published in scientific journal		fragments
2. The potential threats for <i>B. pandi</i> and its habitats are identified through the development of surveys with the local community members, and direct observations of the researchers in the study areas.	The threats for this salamander are identified and documented	Final report of the Pandi Mushroom-tongue salamander project  Surveys documents and Photos of the threats	The local community is willing to collaborate with the project
3. The level of awareness among local community, on the protection of the amphibians and its habitats is increased.	Increased of the interest from people for this species of salamander  Appropriation of <i>B. pandi</i> by the local community due to their endemism  Increasing of practices friendly to the environment in the study areas	Final report of the Pandi Mushroom-tongue salamander project  Testimony of local community  Pictures of meetings and workshops  records of the meetings and workshops signed by the participants	The local community is willing to participate in the activities proposed in the project

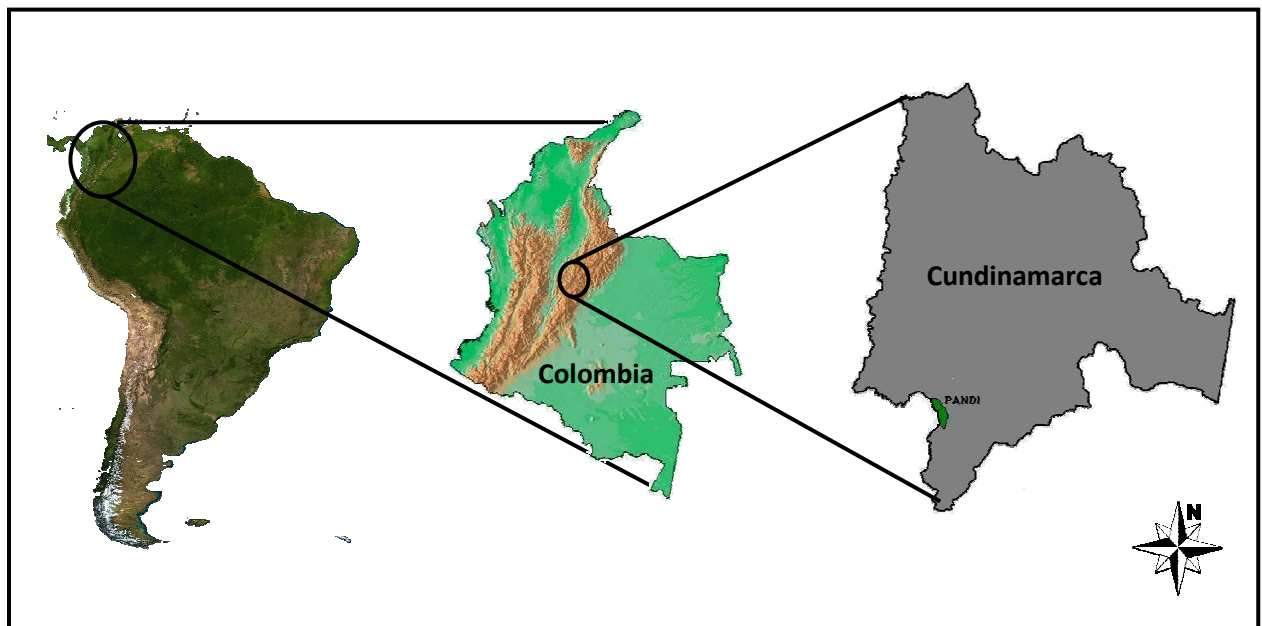
### **Activities**

- 1.1. Designing and organizing of the schedule of the field activities
- 1.2. Performing the logistical arrangements (field equipment, transportation, accommodation, etc.)
- 1.3. Carrying out the searches of the *B. pandi* in the forest relicts of the municipality and surroundings
- 1.4. Obtaining of the data about relative abundances, geographical distribution, natural history and others relevant ecological aspects.
- 2.1. Designing and structuring of the surveys for the inhabitants of the study areas
- 2.2. Recording in field of the different anthropogenic activities that could be affect this salamander in the study areas
- 2.3. Performing the surveys about the threats for the amphibians and its habitats to the local community members
- 2.4. Systematization and analysis of the data from the surveys and the direct observations on the threats to *B. pandi* and their habitats.
- 3.1. Designing the workshops that will be implemented with the local community.
- 3.2. Performing the first meetings with the regional authorities, teachers and community leaders to expose the project
- 3.3. Carrying out the meetings and workshops with the local community about the amphibian crisis and the importance to protect this animals and its habitats

## Methodology

### Study Area

The Municipality of Pandi is located in the southwest of the Cundinamarca department in the western slopes of the Eastern Andes of Colombia (see map). With an average temperature of 23 °C, the municipality of Pandi is part of the Sumapaz province which is highly influenced by the Sumapaz River.



**Geographical location of the study area**

### Sampling method

We are using in every sampling area the technique of Visual Encounter Survey (VES) which is one of the most commonly used survey techniques for frogs and salamanders and it can be used to measure species composition, relative abundance, habitat association and activity. This technique is conducted by observers walking through a

designated area for a prescribed time, visually searching, for animals. The number of animals encountered are noted along with time elapsed during the survey (Heyer, *et al.* 2001 and Lips, *et al.* 2001).

The VES can be applied in monitoring and surveying designs. Visual encounter surveys can determine species richness, provide information for compilation of a species list, and provide data used to estimate proportion of area surveyed that is occupied by target species. Data collected field information on the presence of a species but does not establish absence, nor does it give reliable estimates of abundance. VES can be used along transects, streams, ponds, in quadrants or larger areas. There are three standard sampling designs for VES, randomized walk, transects, or a quadrant design (Heyer *et al.* 2001). We are using the randomized walks with limit of time as standard sampling in our explorations.

The capture of the salamanders is manually and each salamander is placed individually in plastic bags for subsequent measurement and weight with a caliper of 0.1 mm accuracy and a digital scale of 500g respectively. Besides the morphological dimensions and the weight, is document the microhabitat where this was found, date and time of capture, and take note of any relevant data about the ecology and life history of the species. The samplings are performing in the places with historical records and surrounding areas that have similar characteristics to the areas with these records.

The capture effort is 8 hours per day, which is distribute in 4 hours in the day and another 4 hours in the night. A total of 4 field sampling will be conduct by a team of 4 persons. Each sample has duration of 7 days. The estimate of the relative abundance of *Bolitoglossa pandi* will be determine using the encounter rates, dividing the total number of salamanders recorded by the total number of hours spent in the samples (# salamanders / hr).

## Identification of the threats to *Bolitoglossa pandi*

We are carrying out direct evaluations of the possible human activities that could be directly affecting the forest fragments where living the individuals of *B. pandi*; we are also conducting surveys to the residents adjacent to these relics to meet other threats.

### Outputs so far

- During the August sampling was achieved the finding of a population of *B. pandi* in an Andean forest fragment of no more than 10 hectares. This forest relict is located very near to border with the Municipality of San Bernardo, between 2250 and 2300 m.
- In this forest fragment, we have recorded a total of 9 specimens, among which is the first male known for this species.
- This discovery allow extend the knowledge about the morphology of the species and has increased the number of specimens known, which previously were only two.
- As threats to this salamander, we have identified as main threat the deforestation for the adaptation of the lands for crops of fruits (blackberry, passion fruit, physalis, etc.) and the cattle raising.
- Another potential risk to *B. pandi* is may be the overuse of pesticides for these crops of fruit.
- Possible presence of the fungus *Batrachochytridium dendrobatidis* (BD) by the finding of a dead frog; this make necessary to perform the respective tests





**Overview of the study area**



**Overview of the inside the Andean fragment forest**





**Deforestation of the Andean forest due to unsustainable agriculture**



**Dead frog that alert us for the possible presence of the *Batrachochytridium dendrobatidis* (BD) in the study area**





**Searches in the forest relicts in the municipality of Pandi**



**Female of Pandi Mushroom-tongue salamander (*Bolitoglossa pandi*)**





**Photo of the first male report for this species**



**Juvenile at the time of being found among the leaf litter**

## REFERENCES

**Brame A.H. & D.B. Wake 1963.** The salamanders of South America. Los Angeles County. Mus. Contr. Sci., (69):5-72.

**Heyer, W. R., M. A. Donnelly, R. Mc Diarmid, L. C. Hayek y M. Foster (Eds). 2001.** Medición y monitoreo de la diversidad biológica. Métodos estandarizados para anfibios: Editorial Universitaria de La Patagonia. Argentina.

**Lips, K.R., J.K. Reaser, B.E. Young y R. Ibáñez. 2001.** Amphibian Monitoring in Latin America: A Protocol Manual. Monitoreo de Anfibios en América Latina: Manual de Protocolos. Herpetological Circular No.30, Society for the Study of Amphibians and Reptiles.