

## **HM215 Abundance and distribution of threatened amphibian populations in the Cusuco cloud forest, Honduras**

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Cusuco is home to an astounding diversity of rare and endangered amphibian species, some of which are endemic and found nowhere else in the world. There are 6 species of amphibians found only in the Cusuco Park comprising two tree frogs (*Plectrohyla exquisita* & *Plectrohyla dasypus*), one bromeliad frog (*Isthmohyla melacaena*), two arboreal salamanders (*Bolitoglossa diaphora* & *Cryptotriton nasalis*) and one ground dwelling salamander (*Oedipina thomasi*). In addition there are another 10 species that are found in Cusuco but which are endangered under the IUCN categories. Of these, two tree frogs (*Duellmanohyla soralia* & *Bromelohyla bromeliacea*) have their largest remaining populations in Cusuco, and two other frogs (*Craugastor coffeus* & *Ecnimohyla salvaje*) and one salamander (*Nototriton brodiei*) are known from only one other site other than Cusuco. Due to their small ranges of distribution, these species are extremely vulnerable to the deleterious effects of anthropogenic disturbances. Although Cusuco is afforded national park status, it still suffers from a lack of on-the-ground protection and good management practices. This is quite obvious from the encroachment of agricultural activity from the buffer zone inwards towards the central core zone areas. Aside from anthropogenic habitat disturbances on the periphery of the park, recent deforestation has also taken place within the core zone of the park, causing significant habitat degradation in areas inhabited by many endangered and critically endangered amphibian species. In addition, many of the amphibians in Cusuco are infected with amphibian chytrid fungus, an emerging infectious disease which has been responsible for dramatic amphibian population declines and extinctions worldwide. As a secondary assault, the effects of global climate change may also eventually prove to have an impact on some of these species as the microhabitats in montane cloud forests such as Cusuco appear to be changing over time.

Accordingly, it is extremely important that we possess a strong foundation of amphibian population dynamics in order to make wise conservation management decisions in the future. Judging from the current situation, some of the amphibian species may be at risk of extinction and might require future ex-situ management actions to replenish remaining populations. Over a number of years, Opwall surveyors have amassed a large database of species records, providing an extensive inventory of what species are found in Cusuco and which regions and habitats they are most closely associated with. Now, it is important to continue these efforts but to also impair additional efforts to establish amphibian population estimates and begin to develop an understanding of the long-term population dynamics of these threatened species.

Much of this project involves a great deal of hiking through the forest along pre-established transects and along streams and rivers to locate and identify amphibians. We will look for all life stages, including eggs, tadpoles, and adults. Some of this work is conducted during the day, while other efforts are conducted by night with spotlights. The reason for this is that certain species are strictly nocturnal and can only be found during periods of activity at night, whereas other species can be found active during

the day. Population surveys will be conducted at several river sites across Cusuco to determine the status of some of the more threatened species. During these surveys which generally last 2 hours each, you will assist Opwall staff herpetologists to locate every amphibian along a 400m stretch of river. Rather than involving invasive toe-clipping to perform a mark-recapture study, photographs will be used to identify each individual by its unique markings. This activity will be repeated at the same location 3+ nights each and will create a wealth of data to begin telling us whether the amphibian populations are fairly stable, or may be changing from year to year. This information will allow us to monitor for significant population declines which are very possible due to ongoing habitat degradation and the presence of amphibian chytrid fungus.

Early detection of amphibian population declines will provide more time with which to make best management decisions. Often times, management actions are employed after the threatening processes have already devastated populations to frighteningly low numbers and makes it much more difficult to achieve a favorable outcome for in situ conservation efforts. These surveys for amphibian distribution, abundance, and population dynamics will provide the information necessary to make these determinations and allow the greatest chance for the long-term protection of Cusuco's amazing amphibians.

**Suggested reading:**

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