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Project summary

The leading factors contributing to amphibian decline worldwide include habitat modification and fragmentation, climate change, pathogens, invasive species, pollution, overharvesting and the conversion of forest lands to other secondary landscapes. These events have not spared amphibian species in Zimbabwe and the region. Of the 56 known amphibian species in Zimbabwe, only 39 have been recorded in the last 2 years. The Eastern Highlands are the hub of endemism in Zimbabwe, known for their high number of endemic flora and fauna. This fact has not spared the area from the on-going biodiversity loss. Hopkins (2011) highlights that endemic species are more threatened and face higher risk of extinction. Due to lack of long term monitoring on these species it is almost assumed that they may have gone extinct, hopefully not. Among the seven endemic frog species in Zimbabwe, all of them are currently listed in the IUCN Red List (September 2011) of endangered species and five of which are montane species (*Amietia inyangae, Arthroleptis troglodytes, Strongylopus rhodesianus, Probreviceps rhodesianus* and *Vandijkophrynus inyangae*) confined to the Eastern Highlands.

Project objectives

I. To locate and determine distribution on of the five species.

II. Assess habitat conditions.

III. Determine main threats to population of each species.

IV. Create awareness on conservation of amphibians.

What have we accomplished?

From the conception of the project we have managed to gather information concerning amphibians in Zimbabwe and the region. Our first goal was to get in contact and have discussions with people who have worked on amphibians in Zimbabwe and the Eastern Highlands in particular. In this regard we managed to have meetings with Don Braodley and Rob Hopkins (*Research Associate, National Museums and Monuments Zimbabwe*). Apart from these two, we also managed to gather information from James Harvey and Alan Charning who have both carried out some surveys in the Eastern Highlands. The information we gathered include locations (GPS coordinates) were these species were first located and were there have been sited again, information on possible distribution and habitat associations.

The concerned five amphibian species are a distinctive rainy season phenomenon when they are breeding as described by early workers. Thus, to maximise our sampling

survey effort, we limited our amphibian visual encounter surveys to the rainy season, ideally from November to March. Thus surveys will be carried out each month in this period.

With this background, for the 2012 to 2013 rainy season our amphibian surveys started in November and the first one was carried out from 20th- 28th November 2012. Our sampling strategy involved diurnal and nocturnal searches in areas were the five species have previously been sited. The surveys also involved assessing habitat conditions at each of these locations including disturbances both natural and human induced.

Snap shots

Our first survey yielded interesting findings. Among our targeted frog species we managed to locate *Strongylopus rhodesianus* (Chimanimani stream frog). This species had not been located in this area for nearly a decade. It was only recently recorded in Chimanimani (in 2010). We recorded a few individuals of *S. rhodesianus* at the plateau of Mount Inyangani. At this time of the year we expected the Inyangani plateau to be wet with evidence of flowing water instead the area was very dry. Traditionally the area is known to receive winter rainfall and early rains in November of each year. However, observations are showing changes in this rainfall pattern with no winter rains and a very late rain season (now characteristically starting in mid-December instead of early November). This has resulted in drier conditions in the area which are not particularly ideal for the stream frog (*S. rhodesianus*) and river frog (*Amietia inyangae*) which have previously been recorded at this site.

Strongylopus rhodesianus

Mount Inyangani plateau

Apart from our targeted species we encountered and recorded other amphibian species in our surveys (please see photos below). This indicated to us the amount of frog diversity in the area. The most common among the other frog species was *Amietia angolensis* which is a widespread and adaptable species.





Our surveys were helpful in that we were able to carry out habitat assessments. We observed that fire and rainfall are the most common threats to amphibian habitats in this area. The landscape is dominated by pine plantations which are prone to fires during the dry season. This is worsened by increase in the length of the dry season which has extended to November. Thus, the area is becoming increasingly dry. We suspect that this shift in seasons also has an impact on breeding cycles of some of the amphibian species. A typical example of how the area is becoming more drier is Mare dam and the headwaters of Mare River, the dam has nearly dried up and all the streams that flow into this dam are no longer flowing yet they were always known to be perennial (please see photographs below, Mare dam 1-4). *S. rhodesianus* has previously been recorded in one of the streams that flow into Mare dam.

Mare Dam

Mare River

Most forested areas are highly prone to fire, especially areas close to pine plantations. The area has also seen the continued invasion of the black wattle (*Acacia mearnsii*). The pure stands formed by this invasive species are also highly prone to fire. In most areas (e.g photo P3 below) are fire, the vegetation is dominated by ferns which form impenetrable layers. These ferns also act as fuel to fires during the dry ever, there are some areas which are tourist hotspots (Pugwe Falls, Mutarazi Falls, Inyangombe Falls, Mare dam, and Inyangani Mountain) were signs of human pressure are beginning to show. These areas experience increased tourist influx particularly during the holidays. At Mutarazi Falls (see photo P4) we witnessed a group of about 40 pupils having a good time in the river upstream of the falls and this was only a 100m from were type specimen of the elusive *A. inyangae* were collected. The environment surrounding these areas are impacted heavily especially the rivers and the surrounding vegetation. Unfortunately, these are the areas which also provide the unique habitats in which most of the endemic amphibian species have been recorded before.

P1

P2

P3

P4

Upcoming tasks

We are scheduled to carry out more surveys in Nyanga and Chimanimani area. Ideally we have targeted our surveys to coincide with the peak of the rainy season between December and January. From our interaction with the Nyanga National Parks management we gathered that the park does not have an ecologist to drive ecological research in the park, let alone anyone familiar with amphibians. Thus, we agreed to educate and train some of the parks research personal on the importance of amphibian conservation and ecological research on this group of animals. As part of their learning process some of them accompanied us on our surveys both diurnal and nocturnal. They were highly motivated and excited about the new things they were learning, it was evident that they now had a different view on amphibians. The important thing for us is that we now have people on the ground giving us information on aspects such as rainfall patterns and more. Through our upcoming surveys we aim to have a more detailed training workshop for the parks research personal on amphibian identification, ecology and research. We hope that this will at least stimulate further interest in amphibian research in the parks personal and therefore advocate and be actively involved in conservation of these precious endemic frog species.