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Holding on by a Thread: The Plight of the Giant West African Squeaker Frog, *Arthroleptis krokosua*

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The Giant West African squeaker frog (*Arthroleptis krokosua* Ernst, Agyei & Rödel, 2008; hereafter Giant squeaker frog), is evolutionarily distinct from any West African amphibian (3). It differs from all known members of its genus *Arthroleptis* by its large size (> 40 mm snout-vent-length), coloration and other morphological characters, such as a very broad head (2). This unusual frog, though currently listed as Endangered by the IUCN, no doubt may be one of West Africa's rarest and most endangered amphibians. For four successive years since 2009, despite investing thousands of dollars and countless man-hours in finding it, all efforts proved futile up until October 2013 when just a single adult frog was found at Western Ghana's Sui River Forest Reserve (SRFR). Unfortunately, SRFR is constantly under threat from logging, farming, illegal mineral mining and invasion of the alien weed *Chromolaena odorata* popularly called Devil Weed or Acheampong weed (1,2).

To date the Giant squeaker frog has only been recorded a few times. It was first identified in 2002 from a single specimen recorded at the Krokosua Hills Forest Reserve (3), about 30 km to the SRFR.

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Despite subsequent active searching to find more frogs it was not until 2009 that 14 individuals, its highest abundance ever, were recorded at SRFR (1, 2). Thus, only 16 individuals of the Giant squeaker frog have been observed to date, three of which have been kept as museum specimens. The fate of these surviving 13 individuals hangs in the balance due to the prevailing threats at their only remaining home on earth, SRFR. In the light of the persistent threats, which we have highlighted below, to save the Giant squeaker frog from imminent extinction we have proposed herein drastic and focused measures including the upgrading of its conservation status from Endangered to Critically Endangered.

INVASION OF NON-NATIVE WEED *CHROMOLAENA ODORATA*

There are already large fragments within SRFR and the Krokosua Hills Forest Reserve that are characterized by highly compacted soil and secondary growth, clogged with the invasive weed *Chromolaena odorata* (2, 3). *C. odorata* is a non-native plant species that is a major threat to biodiversity throughout the tropics (4). *C. odorata* has formed dense thickets that impede the frogs' movement; it may

also be releasing chemicals into the soil that prevent the growth of native plants. In addition, *C. odorata* also depletes the density of leaf-litter that the Giant squeaker frog utilizes for predator escape, protection from desiccation and breeding activities. We suspect the weed's invasion to be one of the proximate causes of the frog's endangerment.

LOGGING

One-third of SRFR representing 105 km² is under logging, and unfortunately the Giant squeaker frog is restricted to these areas (1, 2). Trees here are taller (50-60 m) than those of most other Ghanaian forests and in particular the large occurrence of economic trees such as mahogany (*Khaya* spp) makes SRFR a target by both logging companies and illegal loggers. Currently, two timber companies Logs and Lumber Ltd (LLL) and John Bitar & Co. Ltd. (JCM) own and exploit timber from concessions within which the Giant Squeaker frog occurs. In addition to the legal removal of trees (supposedly 3 trees/ha), there are widespread illegal logging activities by both timber companies and local people. This extensive logging has led to severe habitat fragmentation, and loss of the species' critical habitats (1, 2, 3). There have also been records of species' variability among its small and isolated populations (2), and it may be that the species is already experiencing an inbreeding depression. Unfortunately, to date, there are still no bylaws in place to minimize the impact of logging activities on its survival.

AGRICULTURE

SRFR is a forest of paradox. It is rich in amphibian fauna (2), and at the same time characterized by rich soils essential for the cultivation of cash crops including cocoa (*Theobroma cacao*), cocoyam (*Colocasia esculenta*) and cashew (*Anacardium occidentale*). As such, local farmers have increasingly encroached the reserve, whenever their farms elsewhere become unproductive due to over-cultivation. This has created pockets of farms in and around the reserve, degrading and fragmenting the Giant squeaker frog's habitats and possibly preventing its recovery from the brink of extinction.

MINING

The only remaining home of the Giant squeaker frog has been the major focus of mining companies due to large mineral deposits here including gold. Such companies and even individuals are constantly prospecting the area illegally leaving behind trails of un-

covered mine pits. Following a series of mass evacuations of illegal miners by government recently (www.ghanamps.gov.gh/news-events/details.php?id=1524), abandoned mines have become even more prevalent, serving the more as ecological traps to the Giant Squeaker frog.

SAVE THE GIANT SQUEAKER FROG!

SAVE THE FROGS! Ghana in collaboration with SAVE THE FROGS! USA and the Amphibian Survival Alliance has established a long term-monitoring program to realise more focused conservation actions. We are currently seeking more funding to sustain this program, which also allows local people and university students to build their capacities while helping to monitor the frog's population status and progress.

We have also embarked on a restoration project to improve the species' habitat conditions (<http://www.savethefrogs.com/frog-blog/save-the-frogs-news/call-for-volunteers-to-restore-habitat-of-the-giant-squeaker-frog/>). But with the available funds we are able to remove the invasive weed *C. odorata* and replant native trees in just 4 ha. With the success of future funding, we plan to establish community tree nurseries to raise more native seedlings. With these seedlings, we will replant in the Giant squeaker frog's remaining habitat ranges to quicken the process of its recovery from the brink of extinction. Please read more about our future habitat restoration plans for the Giant squeaker frog at (<http://savethefrogs.com/amphibians/arthroleptis-krokosua.html>) and also [donate](#) here.

Given the plight of the Giant squeaker frog, we also highly recommend the upgrading of its current status of "Endangered" to "Critically Endangered." This reassessment would offer a stronger political platform for more pragmatic and successful conservation programs, which are crucial to ensure its recovery and long-term protection.

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