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WEIRD & WILD

Volcano Could Mean Extinction for the Rocket Frog

With an eruption looming, scientists struggle to collect the last of a rare species to breed for the future.

By **Jennifer S. Holland**, National Geographic

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Ecuador's few remaining rocket frogs live in the shadow of an active volcano.
PHOTOGRAPH BY JOEL SARTORE, NATIONAL GEOGRAPHIC

Biologists near Quito, Ecuador are rushing to evacuate a critically endangered frog species before a volcanic eruption wipes it out.

The small, chocolate-striped rocket frog—*Hyloxalus (Colostethus) jacobuspetersi*—was once common around Quito, even in pastures and backyards (it adapts well to peopled landscapes). Now, for unclear reasons, there is just one population left. Fewer than 100 adults, plus an unknown number of juveniles and tadpoles cling to life in the Andes along the Río Pita, a river fed by melting snow and ice atop the recently active volcano Cotopaxi.

Ticking Time Bomb

In August, Cotopaxi, whose activity endangers more than 300,000 people, coughed up steam and ash after lying virtually dormant since the early 1900s. The output was limited, but the mountain continues to sputter, and magma is rising within. A much bigger eruption—one that would melt the mountain's snowcap and trigger massive mud flows and floods—could be months, or even weeks, away.

Lava, water, and mud barreling along the Río Pita, combined with layers of ash settling on the land would almost certainly push the rare rocket frogs to extinction. So biologists

are trying to rescue as many as possible before Cotopaxi blows its top.

"Normally an eruption would be almost irrelevant to a species because there would be populations elsewhere that wouldn't be affected," says herpetologist Santiago Ron, of Pontificia Universidad Católica del Ecuador (PUCE) in Quito. But for the rocket frog, the population at risk is the species' last stand.

Since the summer's volcanic activity, Ron's PUCE team has been scouring the frog's habitat, so far bringing 25 tadpoles and a juvenile frog back to the lab. "Dry-season conditions mean the frogs are inactive, making them extremely hard to find right now," Ron says. Plus, they're diurnal (active during the day) and the adults are wary of the scientists' presence.

Gathering will get easier soon. When the rains come—any day now—"the frogs' vocalizations will give away their hiding places," Ron says.

The Cotopaxi volcano, active since August, spews ash and steam. A full-blown eruption threatens not just Quito's human residents but the last wild population of rocket frogs.

PHOTOGRAPH BY DOLORES OCHOA, AP

Long-Time Protectors

Ron and his team are already in the business of saving Ecuador's threatened frogs. The country is the one of the most amphibian-diverse in the world, with more than 550 species described so far (40 percent of those exist nowhere else)—but a third or more are threatened or endangered. With such stats in

mind, Ron and his colleagues' *Balsa de los Sapos* (Life Raft for Frogs) project aims to collect, house, and breed as many national species as possible, with plans to release some back into the wild, when and if the environment allows. *(See also The Vanishing,* National Geographic*, April 2009.)*

Currently, Ron's university lab houses about 1,500 individual amphibians representing 30 species, and they've had some breeding successes—no easy task, as many frogs are fickle reproducers, with very specific climate and food requirements that the scientists are still trying to mimic in captivity.

Rocket frogs are no exception: They're tough to breed and raise. But that effort is a ways off. First, Ron needs to rescue at least 50 adults from the Quito population, plus about 100 tadpoles. "Tadpoles have a low probability of survival in nature," he says. "So bringing them into captivity actually increases their chances for survival to 80 or 90 percent." Also, taking tadpoles has little impact on the population, and animals raised in the lab are more likely to thrive in captivity as adults.

Breed and Put Back?

Collecting a near-extinct species to breed in captivity for reintroduction to the wild isn't unprecedented. For example, in 2001, biologists working in Tanzania collected Kihansi spray toads, which were in rapid decline, and successfully bred them,

eventually reintroducing the toads in 2012.

Can the rocket frog see similar success? Ron hopes so, though it might take years for the current habitat to regenerate after a Cotopoxi eruption. Still, the animals could be reintroduced into parts of their historic range.

"It would be neat to get rocket frogs back to where good habitat still exists," says Don Church, executive director of the Amphibian Survival Alliance. "Why they went extinct so widely isn't entirely documented, but Ecuadorian researchers believe disease and climate change are major culprits."

"These problems have not gone away," Church says, "but we have new tools for potentially mitigating such threats in the wild, such as a skin probiotic that would make frogs more resilient to the deadly chytrid fungus," one of the factors in this and many other amphibians' declines. "These tools need to be field tested on more species in more parts of the world."

And now, with the Quito rocket frog needing special attention, he says, "we have the perfect candidate."

That is, if the volcano doesn't get to them first.

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