

IMPACT REPORT

2024



Center for Ecuadorian Amphibian Conservation



endemic to South America. Even pristine ecosystems, including protected areas, have not been spared from these sudden and drastic declines, prompting intense research and conservation efforts. In recent years, the rediscovery of species previously thought to be extinct has injected hope into conservation efforts. However, these rediscovered populations often lack essential demographic information and face imminent threats in their natural habitats. Urgent action is therefore imperative to ensure the safety of these populations. Various factors have been implicated in the decline of amphibian populations, including pathogens like chytrid strains and ranavirus, evolutionary history of the host species, and environmental stressors such as climate change and its impact on dry seasons. It's becoming increasingly clear that relying solely on habitat protection will not suffice to halt further declines in amphibian populations. Bold and comprehensive conservation actions are urgently needed to avert the extinction of these species.

Frog-diverse Ecuador

Ecuador boasts an incredible biodiversity, earning its designation from the United Nations as a megadiverse country. Particularly in the realm of amphibians, it stands out as one of South America's richest nations. Despite its relatively small size, Ecuador holds the top spot for the density of amphibian species, with a remarkable 655 species identified so far. However, this wealth of biodiversity faces significant threats, including habitat loss, climate change and the highly pathogenic Amphibian Chytrid fungus. Alarming, 60% of Ecuador's amphibian species are classified as threatened according to the International Union for the Conservation of Nature (IUCN) criteria. Globally, there has been a distressing decline in amphibian populations since the late 1980s, resulting in the extinction of numerous species. Notably, 45% of these declines and extinctions have affected groups of frogs



Centro Jambatu

Centro Jambatu, located in Quito, Ecuador, was established in 2011 as a response to the urgent need for amphibian conservation, driven by the alarming decline of amphibian populations worldwide. This facility is largely funded by the Saint Louis Zoo WildCare Institute Center for Ecuadorian Amphibian Conservation. Centro Jambatu’s mission is to research and execute Action Plans for the Conservation of Ecuadorian Amphibians and generate new knowledge and concepts about amphibians, thereby develop a modern “Ark” for amphibians by partnering with Saint Louis Zoo researchers and other amphibian experts. This partnership is designed to mitigate and prevent the decline and extinction of these animals. One of Centro Jambatu’s core strengths lies in its *ex-situ* conservation efforts, where around 60 species of amphibians, including 13 species of critically endangered stubfoot toad, are bred in human care. Here at the Zoo’s Charles H. Hoessle Herpetarium we maintain some of these species as well, acting as an additional *ex-situ* assurance colony for some of the rarest amphibians of South America. Centro Jambatu and the Saint Louis Zoo are internationally recognized experts in the conservation of amphibians and conduct scientific research to deepen understanding of the ecology, behavior and threats faced by amphibians in Ecuador. This research serves as a foundation for informing conservation strategies and developing management plans aimed at species recovery.



WildCare Institute Center for Ecuadorian Amphibian Conservation

Our conservation efforts are framed within a proactive approach intending to address and mitigate traditional and emerging threats to the existence of frogs, toads, salamanders and caecilians of Ecuador. Nevertheless, the conservation of amphibians is challenging due to various uncontrolled factors contributing to the decline of species, including climate change and emergent diseases. With Centro Jambatu we adopt a comprehensive and integral approach, addressing key components, essential to amphibian conservation. These include *ex-situ* and *in-situ* conservation, biobanking and education, with research serving as a cross-cutting element. By collaborating with local communities, government agencies, academic institutions and other organizations, we aim to provide holistic conservation strategies to accelerate progress toward protecting endangered species. In an average year, the Center financially supports a variety of positions at Centro Jambatu, including the salaries of three lab technicians, a veterinarian and a collections manager. These positions are vital in the safeguarding and *ex-situ* reproduction of some of the world’s most endangered amphibians. For many of these species, their only chance at survival is being cared for at Jambatu for eventual release to the wild.

The Center also supports a variety of projects. For example, in 2023 we funded the publication of the Ecuadorian Amphibian Encyclopedia. This manuscript includes the first ever complete overview of all species of frog, salamander, and caecilian that occur in Ecuador, a massive undertaking. This piece will be a great resource for herpetologists and conservationists throughout the country and beyond.

2023 Supported Positions and Project	2023 expenses
Lab Technician Salaries x3	\$30,771
Veterinarian Salary	\$13,332
Collection Manager Salary	\$20,000
Lab Materials	\$625
Encyclopedia of amphibians	\$4,000
Total	\$68,725



data on factors like pathogen response, foraging behavior, reproductive success, and microbiota dynamics, all crucial for refining reintroduction strategies.

Additionally, we conduct research on assisted reproduction technologies to enhance breeding success in laboratory settings and optimize genetic management of *ex-situ* populations. Notably, a recent project of the Living Earth Collaborative allowed Centro Jambatu, the Saint Louis Zoo's WildCare Institute, and the Missouri Botanical Garden to utilize eDNA techniques to search for species thought to be extinct. In 2022 Zoo staff assisted with carrying out this project in Ecuador, visiting 11 field sites and collecting more than 50

Achievements in Conservation

Due to long lasting support of the Saint Louis Zoo, Centro Jambatu is at the forefront of breeding and conserving endangered amphibians, achieving significant milestones in the recovery of some amazing species. To date, around 60 species have been reproduced in the *ex-situ* labs of Centro Jambatu for research and conservation purposes, with an emphasis on rare and highly endangered frogs and toads.

Our commitment extends beyond breeding programs; we actively engage in *in-situ* conservation efforts by aiding in the protection of habitats in three private reserves and monitoring populations of critically endangered species serving a pivotal role in conservation efforts. By preserving specimens, DNA tissues, skin peptides, and sperm from endangered species housed in captivity, we create a crucial resource for future conservation efforts, including the potential for *in vitro* fertilization. Centro Jambatu's scientific collection harbors around 300 species of specimens, tissues, peptides, and around 100 sperm samples of four threatened species. Our dedication to species reintroduction is evidenced by our ongoing studies, exemplified by our work with a marsupial treefrog, *Gastrotheca riobambae*. Insights gained from these studies inform our broader research agenda, which includes "preadaptation" studies with stubfoot toad species. These studies investigate the adaptability of laboratory-born individuals to wild environments, providing essential



samples. This project is showing promising initial results, forming the basis for focused conservation efforts for additional critically endangered species and identifying possibly extinct species.

Finally, education is central to our mission to inspire collective action toward the protection of amphibians and their ecosystems in Ecuador. Through initiatives like the Wikiri Sapoparque exhibit in Quito, Ecuador and public displays in the Zoo's historic Herpetarium, we reach out to the broader public in Ecuador and beyond, fostering awareness and engagement in amphibian conservation. We also are vested in the education of local communities who live side by side with amphibians. For example, in 2023 the Zoo sent two staff to assist in field conservation studies of the Quito stubfoot toad (*Atelopus ignescens*), a critically endangered species. While conducting field work Zoo staff also took part in an educational demonstration in a local village, teaching young children about the importance of amphibian conservation and the Saint Louis Zoo's dedication to saving wild animals and wild places.

Future Perspectives

We have made significant strides in the conservation and research of amphibians. However, there is still a considerable journey ahead in terms of scientific endeavors and actionable measures to restore amphibian populations and their ecosystems. Looking ahead, we hope to continue protecting the amphibians of Ecuador and their habitats while learning more about them. We are confident our continued collaboration will ensure Ecuador's beautiful frogs, toads and other amphibians will persist for generations to come. As we learn more about these animals and make impacts on the protection of their habitat, the reality of reintroduction of lab raised animals from Centro Jambatu to the wild becomes more possible. It is our hope that with continued support we will allow endangered frogs and toads to return to and thrive in the mountains and forests of Ecuador.