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Axolotl verges on wild extinction

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Editor, Earth News

A captive albino axolotl displays its larval gills

The amphibian that never grew up is on the verge of going extinct in the wild.

New survey work suggests that fewer than 1,200 Mexican axolotls remain in its last stronghold, the Xochimilco area of central Mexico.

The axolotl is a type of salamander that uniquely spends its whole life in its larval form.

Its odd lifestyle, features and ability to regenerate body parts make it a popular animal kept in labs, schools and as pets.

But in the wild, the future is bleak for this "Peter Pan" of animals.

> **Reintroduction is not a good idea because it reduces the genetic variability and increases the chances of disease**
>
> Biologist Dr Luis Zambrano

Recent surveys suggest that between 700 and 1,200 axolotls (*Ambystoma mexicanum*) survive in six reduced and scattered areas within the Xochimilco area of the Mexican Central Valley.

One of these surveys found just a single axolotl in the whole study region.

The long-term survival of the axolotl in the wild has now become critical, and demands urgent action to restore the animal's number and habitat, say scientists monitoring the population.

Forever young

The Mexican axolotl is highly unusual.

Altogether, there are around seven species of salamander belonging to the genus *Ambystoma*.

A captive dark colour morph

All are quite similar and may be called axolotls. Most are capable of retaining their larval forms throughout their whole lives.

But they usually do so in response to their environment, for example, if temperatures are too cold to emerge onto land as an adult salamander, the tadpole larvae may just keep growing underwater instead.

But the Mexican axolotl is the only species that never undergoes metamorphosis.

Instead each generation lives underwater as outsized larvae. Males and females mate underwater and the females lay eggs on nearby structures such as plants.

The Mexican axolotl's odd looks and unusual life history have also made it a favourite pet, and the subject of extensive biological research into its physiology.

Population crash

Though accurate information about the population of wild Mexican axolotls is hard to come by, recent evidence suggests that the population has declined alarmingly in

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recent decades.

For example, in 1998 there were thought to be around 6,000 axolotls per square kilometre of the Xochimilco.

Eggs of the endangered axolotl

By 2004 just 1,000 lived in the equivalent area, and by 2008 around 100 animals survived per square kilometre, Dr Luis Zambrano and colleagues at the National Autonomous University of Mexico, based in Mexico City report in the journal Biological Conservation.

That is a ten-fold reduction in four years and a 60-fold reduction in ten years, leading the International Union for Conservation of Nature to classify the species as endangered on its annual Red List of threatened species.

Now "our best estimates using unpublished data, but with two different techniques, sampling and genetic, suggests that the total amount of axolotls in the wild is between 700 and 1,200 animals," says Dr Zambrano.

"We are still analysing the data, so it may change a little bit. But we don't think it will change by an order of magnitude."

The axolotl's range is also highly restricted.

An axolotl in its larval, but much younger form

Dr Zambrano's team has surveyed the Xochimilco, a complex water system of artificial channels, small lakes and temporary wetlands that help supply Mexico City, a nearby city of some 18 million people.

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As the city has increased in size, it has dramatically reduced the axolotl's natural habitat.

Zambrano's team calculate that the salamander now exists in just six isolated parts of the water system, often near to some of the few remaining natural springs supplying clear, fresh water.

Their most recent work shows that the reduction in water quality is one of the main factors driving the axolotl to extinction in the wild.

Another is the presence of large numbers of introduced carp and tilapia fish, which both compete ecologically with axolotls for food and resource, and also eat axolotl eggs.

Little refuge

While captive colonies of axolotls exist across Mexico, the US, Canada, Germany, the UK and Japan, reintroducing these animals would be a bad idea, say the scientists.

Prime axolotl habitat

"Reintroduction is not a good idea because it reduces the genetic variability and increases the chances of chytrdiomicosis disease," says Dr Zambrano.

Chytrdiomicosis is an often fatal condition caused by the chytrid fungus, which is decimating amphibian populations around the world.

Dr Zambrano's team are now embarking on a programme to create wild refuges for the Mexican axolotl, in a bid to arrest the decline in its numbers and prevent it going extinct in the wild.