

# **Biologist makes extinction predictions for frogs based on the past**

October 6 2015, by Bob Yirka

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An Australian striped marsh frog (*Limnodynastes peronii*). Credit: John Alroy

(Phys.org)—Australian biologist John Alroy, with Macquarie University has published a paper in *Proceedings of the National Academy of Sciences* outlining his study and analysis of two groups of animals; amphibians and reptiles, focusing on extinction rates of the past and likelihood of extinction in the future. He suggests the data indicates that unless something changes, frogs are on a path of mass extinction.

Alroy reports that he got the idea to conduct a survey on the two animal groups when someone not in the field asked him how many [species](#) have gone extinct in modern times, and discovered that few studies have been done to find out. His study consisted of surveying museum literature and published papers to ascertain populations of species and then used the Bayesian statistical method to derive extinction probabilities over the coming years. Among other data, he found that frogs appear to be the species most at risk—approximately 200 species of them went extinct (out of a total of 6355) over just the period 1960 to 1990, which accounted for 3.1 percent of the total number of species.

Alroy suggests that global warming likely has something to do with the increasing rate of extinction for frogs (his calculations show an extinction rate of 6.9 percent over the next century, not including future unknown threats) but cautions against singling out a single culprit. He notes that other factors are at play, most notoriously *Batrachochytrium dendrobatidis* a type of fungus that has decimated frog populations in Brazil and Central America. He suggests other causes can likely be attributed to air and water pollution, invasive species and loss of habitat. He also points out that there were major geographic differences in [extinction](#) rates—South America, for example saw a lot more loss than did North America, Europe and Asia, and Madagascar saw a lot of loss

while the African continent fared reasonably well. Putting it succinctly, Alroy notes that things are getting worse for [frogs](#) and suggests the situation is worrisome, especially when considering that he took a conservative approach in making his estimates—he suspects there have been more extinctions than he has found, especially in areas where documentation is sparse, such as the jungles of South America.

**More information:** Current extinction rates of reptiles and amphibians  
John Alroy, [DOI: 10.1073/pnas.1508681112](https://doi.org/10.1073/pnas.1508681112)

### Abstract

There is broad concern that a mass extinction of amphibians and reptiles is now underway. Here I apply an extremely conservative Bayesian method to estimate the number of recent amphibian and squamate extinctions in nine important tropical and subtropical regions. The data stem from a combination of museum collection databases and published site surveys. The method computes an extinction probability for each species by considering its sighting frequency and last sighting date. It infers hardly any extinction when collection dates are randomized and it provides underestimates when artificial extinction events are imposed. The method also appears to be insensitive to trends in sampling; therefore, the counts it provides are absolute minimums. Extinctions or severe population crashes have accumulated steadily since the 1970s and 1980s, and at least 3.1% of frog species have already disappeared. Based on these data and this conservative method, the best estimate of the global grand total is roughly 200 extinctions. Consistent with previous results, frog losses are heavy in Latin America, which has been greatly affected by the pathogenic chytrid fungus *Batrachochytrium dendrobatidis*. Extinction rates are now four orders-of-magnitude higher than background, and at least another 6.9% of all frog species may be lost within the next century, even if there is no acceleration in the growth of environmental threats.

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