

8 in 10 lizards could be at risk due to deforestation

March 5 2024



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In Colorado, people flock to the Rocky Mountains when the summer heat gets unbearable. Animals seek shelter too when temperatures become extreme, and forests serve as critical sanctuaries for small tree-

dwelling animals like lizards.

In a new study published March 5 in the journal *Nature Climate Change*, scientists from the University of Colorado Boulder and Tel Aviv University in Israel revealed that [deforestation](#) combined with climate change could negatively impact 84% of North America's lizards by the end of the century. Nearly one in five could face [population decline](#).

Unlike mammals that can maintain their body temperatures in a variety of ways—sweating when it gets too hot and relying on warm fur when it gets too cold—cold-blooded animals like lizards have limited strategies to thermoregulate. Tree-climbing lizards move around [tree trunks](#) to bask in the sun for warmth. When the ground gets too hot, they climb higher or move into the shade.

"What's really interesting about lizards is that they just need to be able to move a short distance around the tree trunk to get to a very different climate and habitat environment," said Keith Musselman, an assistant professor in the Department of Geography and CU Boulder's Institute of Arctic and Alpine Research. "These microhabitats are particularly important when we think about how we modify our natural environment and make conservation decisions."

Using [computer simulations](#), the team showed that global warming can actually benefit lizards living in colder regions or at higher latitudes in North America. Warmer weather increases the animals' activity time, meaning they have more time to look for food or mates during the day. However, deforestation would largely reverse these positive effects by reducing opportunities for shade in hotter climates that help them cool down.

The team simulated lizard models for different climate regions across North America. They found that tree loss could decrease lizards' activity

time by an average of 34% by the end of the century. Without trees, the animals would have to hide under rocks or in caves to avoid overheating. The impact would be especially prominent for species that already live in warmer regions, where future summers will become too warm for activity on the ground.

The team estimated that deforestation would accelerate population declines for 18% of lizards in North America.

"Our work provides new insights into the mechanisms by which deforestation may cause population declines in the face of climate change," said Ofir Levy, a zoologist and Musselman's collaborator at Tel Aviv University. "The decline in lizards can lead to a cascading effect as they are an important part of almost every ecological system."

Despite international pledges to halt deforestation, tree clearing continues to happen globally. From 2001 to 2022, about 459 million hectares, or 12%, of global tree cover disappeared.

"Deforestation is a worldwide problem, and our conclusions can help decision-makers on other continents in designing conservation and habitat restoration programs that consider climate change," said Omer Zlotnick, the paper's first author and a Ph.D. student at Tel Aviv University.

Lizard populations are already at risk because of [climate change](#). In one study, scientists estimated that 54% of lizard populations in Mexico would go extinct by 2080 because of their inability to adapt to the rapidly warming planet.

Deforestation would further exacerbate the threat by taking away these animals' refuges.

"Here in the Rocky Mountains, elevation provides an escape for animals that can travel longer distances, including us humans. On those summer days when it hits 100 degrees, many of us will go into the mountains. But small animals like lizards can't travel far. They heavily depend on the refuge provided by the local landscape, including tree trunks," said Musselman. "The study highlighted the importance of understanding which elements in the environment can serve as refuges for other organisms on this planet."

More information: Omer Zlotnick et al, Deforestation poses deleterious effects to tree-climbing species under climate change, *Nature Climate Change* (2024). [DOI: 10.1038/s41558-024-01939-x](https://doi.org/10.1038/s41558-024-01939-x)

Provided by University of Colorado at Boulder

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