

# As rising temperatures threaten urban wildlife, experts recommend protecting green spaces

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When a family of red foxes popped up in Lurie Garden in May, frolicking through Millennium Park and grooming each other on a

concrete slab, Seth Magle said it was an exciting development for a species that is becoming increasingly rare in the Chicago area.

But city dwelling may no longer be an option for foxes for long, Magle said, as urbanization and climate change threaten their homes.

"We see fewer foxes every year. We already have pretty much lost one of our fox species, which is the gray fox, and our red foxes are not doing well," said Magle, the director of the Urban Wildlife Institute at Lincoln Park Zoo.

Foxes aren't the only mammals in danger, according to a [study](#) Magle and a group of scientists published in *Nature Ecology & Evolution*. While urbanization negatively affects [species diversity](#) across North America, they found that it hits critters living in warmer cities with less vegetation the hardest. Their research suggests that climate change could worsen this effect.

"If you continue to increase pressure on species by increasing temperature, and if they already don't have very many places to live, that's pretty quickly going to bring them to a breaking point," Magle said.

Researchers examined photos from 725 camera-traps in 20 cities in the United States and Canada, from Chicago to Los Angeles to Seattle, creating what Magle called an "unprecedented data set." During summer months, the cameras captured images of 37 native mammal species, including skunks, squirrels and rabbits. The cities are part of the Urban Wildlife Information Network, a group that's studying ecology and behavior of urban species.

Using cameras placed at Chicago Park District sites, cemeteries, the Argonne National Laboratory in Lemont, Fermi National Laboratory in

Batavia, university campuses and forest preserves in Cook, Lake, Will and DuPage counties, scientists detected about 20 species in Chicagoland. Photos show a white-tailed deer munching on grass, a beaver walking by a tree and a group of four foxes playing with each other.

## Where Chicago ranks

Chicago is somewhat of a mixed bag in terms of supporting urban wildlife, Magle said. In line with previous research, their study found that wild mammals are less common and less diverse in more urbanized places, which doesn't bode well for the third largest city in the nation.

However, Chicago is cooler, more humid and has more vegetation compared with other cities like Phoenix, helping mitigate some of the effects of urbanization. While climate change isn't good for wildlife anywhere, Magle said Chicago is relatively well positioned to cope with it.

"We're located pretty far north among the cities that we looked at in this study ... but also we have a ton of vegetation in the form of all of our forests preserve districts, our parks," Magle said. "Chicago, we are the city in a garden. We really have tried to do a good job of protecting these [green spaces](#) and that's what's going to help us to keep our wildlife and our biodiversity as global warming continues to intensify."

While rapidly growing cities in dry areas, such as Phoenix, Dallas or Austin, should be more concerned, Magle said climate change will affect wildlife in every city. Magle said it's possible that armadillos, a gray-brown mammal with a pointy snout, could dig their burrows in Chicago, for example.

"We have armadillos in the south part of Illinois now," Magle said. "It

seems kind of hard to imagine but I think it is possible that at some point a species like an armadillo that's a more dry adapted, more warm adapted species might be here in our city."

## **Climate change's impact on foxes**

While it's difficult to determine effects on a species-by-species basis, the study found that larger-bodied animals, such as mountain lions and bears, were more negatively affected by urbanization than smaller ones like squirrels and rabbits. Magle said he's most concerned about animals that are already on the decline, namely foxes.

Using a variety of techniques, including examining roadkill numbers, evidence shows that fox populations have been decreasing in Illinois for at least a few decades, concerning wildlife managers throughout the state, according to Eric Schaubert, director of the Illinois Natural History Survey at the University of Illinois at Urbana-Champaign.

He said there's a variety of potential explanations for the decline, from [habitat destruction](#) to an increase in coyote populations. Coyotes are known to compete for food with foxes or even prey upon them. Unlike gray foxes, Schaubert said red foxes are more adapted to living in urban areas, so they are the primary type found in the Chicago area.

"As the Chicago metropolitan area has expanded outward, into what used to be farmland, that has reduced some types of habitat and the squeezing of the remaining green spaces in more of the central areas," Schaubert said. "But Chicago, among big cities, has done a really good job of actually improving the habitat characteristics of the forest preserves within the city area."

In general, Schaubert said foxes do better in open, green spaces with lots of cover, which will help them as temperatures increase. He said

maintaining parks and restoring native grassland and savanna habitats should be a priority. He added that it's promising that, because red foxes are found from Florida to Canada, they can survive in a wide range of temperature conditions.

"Foxes also eat fruit," Schauber said. "So if we had persimmon trees or crab apples or other types of fruiting trees, and they also eat acorns as well."

There are serious downsides to a declining fox population, Schauber said, especially in the "rattiest" city in the U.S., according to the pest control company Orkin. He said foxes eat small prey like squirrels and rats, helping control their populations so they don't get to pest levels. Magle also said rats are one of the most "resilient and adaptable" animals, meaning even [climate change](#) probably won't knock them out of the [city](#).

"Foxes are really amazing animals. They're socially very interesting. They tend to be monogamous. They are just really aesthetically great to look at," Schauber said. "Whenever I see a fox, which is not very often, I'm always excited about it. And just knowing that they represent the resilience of nature and the ability of animals to adapt to changing environments."

## **Ways to help urban wildlife**

While researchers weren't able to reach a definitive answer as to why wildlife thrives in cooler cities with lots of green spaces, Jeffrey Haight, a postdoctoral scholar at Arizona State University and the primary author of the study, suspects it has to do with the urban heat island effect. Urban areas can experience higher temperatures than outlying areas because buildings, roads and other infrastructure hold heat more than natural landscapes.

Haight noted that vegetation provides necessary refuge for wildlife in cities, helping them avoid humans or predators.

"This is a challenge that people are having to deal with alongside wildlife. Extreme heat is a major problem across the world," Haight said. "The efforts that we take to mitigate that problem for people will also benefit wildlife that we share our cities with."

There are easy steps people can take to make a more wildlife-friendly Chicago, Magle said. He suggests people put native plants in their backyard, secure trash from species like rats or even volunteer with a local park or forest preserve.

Magle said he has a variety of research in the works, including examining how redlining has influenced wildlife and installing acoustic devices to monitor bats and birds. One of the limitations of this study was that the camera traps are better at detecting medium to large-sized mammals, meaning the researchers couldn't analyze birds or small mammals such as mice and shrews. He'd also like to make the network global, expanding to places like Madagascar, Germany and Mexico.

"As we build our cities, we need to remember to give animals a seat at the table because they are residents here and they always will be," Magle said. "It's going to make a huge difference towards creating a better kind of planet, a kind of a planet where we can protect rare species and protect biodiversity even as we continue to urbanize."

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