

## Biodiversity Unit – Article: Species loss spreads infectious disease

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The extinction of plants and animals can harm human health by fuelling the spread of infectious disease, scientists have found. Researchers explored the link between biodiversity and infectious diseases such as West Nile virus, Lyme disease and hantavirus in Thursday's issue of the journal *Nature*.



*The white-footed mouse, shown with a tick in its ear that transmits bacteria causing Lyme disease in humans. The mouse is most likely to remain in forests as biodiversity declines. (Courtesy Nature/J. Brunner)*

Loss of biodiversity often increases disease transmission, biologist Felicia Keesing of Bard College in Annandale, N.Y., and her co-authors found. Evidence suggests that preserving ecosystems — from agricultural fields, coral reefs, barns and even the inside of our bodies — and biodiversity should reduce the prevalence of infectious diseases in general, the review concluded. Since the findings included microbial diversity in our bodies, avoiding overuse of antibiotics in medicine and agriculture is essential, the authors said.

Infectious diseases by definition involve interactions between species, including at least a host and pathogen, the researchers noted. For example, the white-footed mouse hosts the bacteria that caused Lyme disease in the northeastern U.S. When forests become fragmented, the white-footed mice thrive while buffering species like the opossum are lost. The mice increase numbers of both the tick that carries the disease to humans, as well as the bacteria that cause Lyme disease, said study co-author Richard Ostfeld of the Cary Institute of Ecosystem Studies in Millbrook, N.Y.

Scientists don't know why the species that are most resilient when biodiversity is lost are also the ones that also amplify pathogens, he said.



*Seeding experimental fields in Cedar Creek, Minn., with a diverse mixture of seeds reduced incidence of fungal pathogens three-fold, scientists found. (Courtesy Nature/Cedar Creek LTER site)*

The researchers called for careful monitoring of areas where large numbers of domesticated animals are raised to reduce the likelihood of an infectious disease jumping from wildlife to livestock and then to humans.

"Biodiversity itself seems to protect organisms, including humans, from transmission of infectious diseases in many cases," the researchers wrote. "Preserving biodiversity in these cases, and perhaps generally, may reduce the incidence of established pathogens." The research was also funded by the U.S. Environmental Protection Agency.

### Follow Up Questions

1. Briefly summarize the article. What effect does a decrease in biodiversity cause?

2. Why or how do you think this effect occurs?

3. The article states “Scientists don't know why the species that are most resilient when biodiversity is lost are also the ones that also amplify pathogens.” Make some hypotheses. Why do you think the surviving species are also the ones that amplify pathogens?

4. What can we do to help this situation? Explain.