

Saving salamanders: Searching for signs of a deadly fungus

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In this photo taken Wednesday May 18, 2016 wildlife biologists Evan Grant holds a type of salamander, the red-spotted newt, from Beebe Pond in Sunderland, Vt. Grant is one of many from the U.S. Geological Survey team of scientists studying salamanders across the county to determine weather a deadly fungus is infecting the species in the U.S.(AP Photo/Jim Cole)

Holding a sandwich bag containing a squirming, Eastern red-spotted newt, Evan Grant inspects its shiny skin for signs of a killer.



If he finds what he's looking for, a gruesome fate awaits the amphibian. Ulcers would cover its body, eating away the skin and killing it outright or leaving it vulnerable to infection. Breathing would come with difficulty, and the lizard-like creature couldn't absorb through its skin the water and minerals it needs.

Death would follow, not just for the specimen Grant holds at a pond in Vermont, but for any salamander afflicted by a fungus that has ravaged its brethren in parts of Europe. There's no sign it has yet reached North America, home to 190 of the world's 655 salamander species, but scientists aren't taking chances.

Fearing the fungus could reach the United States through the pet trade, Grant and an army of fellow wildlife biologists with the U.S. Geological Survey , the lead federal agency in the fight, are checking salamanders nationwide. The goal is to take samples from 10,000 salamanders—including red-spotted newts from Maine and New Hampshire down to Virginia and over to Louisiana; Pacific newts in California and Oregon; and the flatwoods salamander in Florida, among others.

"We have the highest biodiversity of salamanders in the world," said David Hoskins, assistant director of the U.S. Fish and Wildlife Service's fish and aquatic conservation program. "We were concerned that once the fungus reaches the United States—if it was introduced into wild populations—it could become established and spread and potentially wipe out important species of salamanders."

They may be small, hard to spot and overlooked compared with tigers and polar bears. But salamanders are critical indicators of environmental health, and their roles in wetlands, lakes and forests are critical in controlling insect populations and providing food for other animals. Anything that harms them stands to harm other species.



The USGS hasn't yet found the fungus in any of the nearly 1,000 salamanders it has sampled across the country. But there are many more salamanders than biologists looking for them.

Researchers believe the fungus, related to one that has decimated frog populations around the world, likely arrived about seven years ago in Europe through the pet trade and was released in the wild when captive animals escaped or were abandoned. It has since been found in captive populations of fire salamanders, Europe's best-known species, in the United Kingdom and Germany. There have also been outbreaks in wild populations in Belgium.



FILE In this Aug. 1, 2003 file photo a spotted newt crawls in the rain in Unity, N.H. Scientists across the United States are surveying lakes and ponds to determine if a deadly fungus is infecting salamanders. The fungus has already ravaged populations in parts of Europe, and concerns are growing that it will reach North America.(AP Photo/Jim Cole/FILE)



Wherever the fungus has been found, the end result is not good. In the Netherlands, the fungus has wiped out almost all fire salamanders.

The loss of what's known as a "sentinel species"—the proverbial canary in the coal mine—could "disrupt the equilibrium of the ecosystems" across Europe, said An Martel, a Belgian professor who discovered the fungus on salamanders in the Netherlands.

"Very few animals are left," Martel said. "It has had a huge impact. The populations where the fungus is present are almost gone. We don't find any salamanders anymore."

The U.S. Fish and Wildlife Service, whose role is regulating the trade in amphibians and other species, in January prohibited 201 salamander species from being imported or traded across state lines, which should put a dent in a pet industry that saw 2.5 million salamanders imported between 2004 and 2014.

The move aims to get ahead of the fungus and avert the problems that came with combating the frog fungus, which wiped out several species before action plans started, Hoskins said.

At the pond in Vermont's Green Mountain National Forest, the shoreline teeming with red-spotted newts, Grant and colleague Adrianne Brand trapped as many as 30 in small nets or wire traps resting on the lake bottom.

The pair measured the newts, recorded sex ratios and looked for signs of the fungus, Batrachochytrium salamandrivorans, commonly called Bsal. Then they swabbed the creatures' hands and underside for any evidence of Bsal and put the samples in a test tube for freezing and shipment to the USGS National Wildlife Health Center in Madison, Wisconsin, for analysis.



If the fungus is found, the response would depend on the location and the likelihood of it spreading; it could include limiting access to certain spots as well as quarantining or treating sick salamanders.

"For salamander diversity, I would hope not to find it," Brand said. "But it is an interesting scientific issue. We have a chance to learn a lot. If it is a problem, we have a lot to learn about being on the forefront of disease."

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