Scientists seek clues to deformed

FROGS

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any, so I showed him to the teacher."

As Reinitz examined the amphibian, a girl brought over another frog, this one with a withered hind leg. Then another. All told that morning, the class caught 22 frogs, 11 of which had deformed hind legs.

"I think the kids got kind of scared," said Reinitz. "They immediately started asking me what the cancer rate was in the area."

Shaken, Reinitz alerted a local wildlife biologist, and the frogs eventually were reported to the Minnesota Pollution Control Agency in St. Paul. It would be the first of many such reports the agency would receive in the coming months.

Deformed frogs have now been found at more than 100 sites in 54 of Minnesota's 87 counties, and researchers here believe they're everywhere in the state. Deformed frogs also have turned up across Wisconsin and in the St. Lawrence River Valley in Quebec.

Last week, as Minnesota's frogs began heading for their wintering locations on the bottoms of deep lakes and rivers, where they rest atop one another in large piles, the Environmental Protection Agency convened a conference of scientists in Duluth. Val Beasley, a professor of veterinary medicine at the University of Illinois, told the group of more than 60 researchers what they all already seemed to be thinking.

"Are we concerned about the animals as a monitor of conditions that would cause us concern for humans?" Beasley asked. "Or are we worried about the animals in and of themselves? I think the answer is that we're worried about both."

Frogs serve as a "sentinel species" because many of their metabolic functions are similar to the same processes in humans, said Robert McKinnell, a geneticist and cancer expert at the University of Minnesota who has been doing research on frogs since 1958.

"The whole state appears to be affected," he said. "We should be alarmed."

Joe Tietge, the EPA research biologist who organized the conference, said he was certain that the problem is an environmental one.

"It's just not normal to see deformed animals," he said.

Nor is it pleasant. Scientists at last week's conference were appalled at the graphic evidence presented to them — most notably by photographs of hideously deformed frogs shown by David Hoppe, a herpetologist from the University of Minnesota's Morris campus. Hoppe is a member of a research team from the university and the pollution agency that received an emergency grant of $123,000 from the Minnesota Legislature to study the frog problem last summer.

The team, which could scarcely keep up with the reports pouring in from all over the state, found frogs with missing legs, extra legs, misshapen legs, paralyzed legs that stuck out from the body at odd places, legs that were webbed together with extra skin, legs that were fused to the body, legs that split into two half-way down. They also found frogs with missing eyes. One memorable specimen was a one-eyed frog that turned out to have the second eye growing inside its throat.

Hoppe's most important find was at a site in Crow Wing County, in the heart of Minnesota's most popular lake vacation district. In a small, seemingly pristine lake, Hoppe found abnormalities in five species of frogs and one toad. Significantly, the mink frog, the species with the highest incidence of deformity at around 50 percent of the total, is the species that spends the most time in the water. American toads and wood frogs, which were the least aquatic species, had rates of deformity of less than 5 percent.

"Mink frogs are rarely more than a jump away from the water," said Hoppe, "and as tadpoles they don't metamorphose until their second year. What I found at this site was a really gross-looking batch of mink frogs."

Virtually all the deformed frogs will die. Frogs with compromised limbs cannot feed themselves or escape from predators. Hoppe said it's rare to find an adult frog with a substantial limb abnormality.

In the meantime, Hoppe concedes that nobody knows what to tell people in Minnesota who want to know what all this might mean to them.

"The landowner up in Crow Wing County asked me if he should stop his kids from swimming in the lake," said Hoppe. "And I had to say that I just didn't know. But I told him that I wouldn't let my kids near it."

At last week's conference in Duluth, the possibilities raised to explain the frogs' deformities appeared almost limitless. Early evidence points to something in the water where the frogs breed and develop, and in which they spend every stage of life. Their skin is highly permeable: What gets in the water can get into the frogs. Two theories are receiving the most scrutiny.

One is that the frogs have become infested with naturally occurring parasites. Stan Sessions, a biologist from Hartwick College in New York, has demonstrated an apparent cause-and-effect relationship between a common parasite and the development of extra limbs in frogs that were found in ponds in Northern California a few years ago. In Sessions' explanation, cysts form around the parasite after it enters a tadpole. The cysts in turn disrupt the development of emerging limbs, causing two to sprout where one should.

But most conferees were skeptical that parasites alone could explain the wide diversity of malformations in Minnesota's frogs — and so, in the end, was Sessions himself. "What I've heard

Deformed frogs in Minnesota worry experts

BY WILLIAM SOUDER
Washington Post

DULUTH, Minn. — On Aug. 8, 1995, teacher Cindy Reinitz took a group of her middle school students on a field trip to a farm in the town of Henderson in south-central Minnesota. As they walked along, the kids started chasing frogs. Jeff Fish, a red-haired, freckle-faced 13-year-old, caught the first one that didn't look right.

"When I picked him up, I saw that he was missing his right hind leg," said Jeff. "My first instinct was that a predator had bitten it off. But I looked him over for sores or scars and I didn't see

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