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Arkansas' aquatic cave fauna being threatened by pollution

BY ALDEMARO ROMERO
SPECIAL TO THE SUN

Arkansas is famous for its variety of cave fauna. From bats to minute invertebrates, the Natural State has a diversity of subterranean species that marvels not only scientists but also the casual observers.

Although many of the Arkansas caves are well guarded by either their private owners or by governmental agencies, their fauna is being threatened by human activities that take place above those caves.

Caves are fragile habitats not only because they tend to be small in size but also because most of their animal populations are also small. To make things worse, once pollutants get into caves, their recycling is extremely slow, making their effect on the fauna a long-lasting and usually irreversible one.

Subterranean water is found not only in caves but also filling up space in between rocks. That is what researchers call phreatic waters. Although not accessible to humans, pumping through wells has allowed us to learn that phreatic waters may contain a very rich and interesting fauna.

For example, in the spring of 1940 two individuals of the blind and depigmented southern cavefish were pumped out of a well in Randolph County. One of the specimens is now found at the Museum of Zoology of the University of Michigan.

However, pumping for agricultural and urban activities is reducing the quantity of water in caves and phreatic zones.

Water quality is also being degraded by several factors: agricultural runoffs, urbanization, landscape modification and industrial activities including mining. During these processes a number of chemicals enter in contact with the soil and because the highly permeable nature of limestone rocks in which most caves

are found. Those chemicals percolate until reaching both the groundwaters and the caves themselves. Agents causing this type of pollution include, but are not limited to, fecal bacteria, organics from manure, septic leachate, sewage sludge, sediment and toxic concentrations of metals.

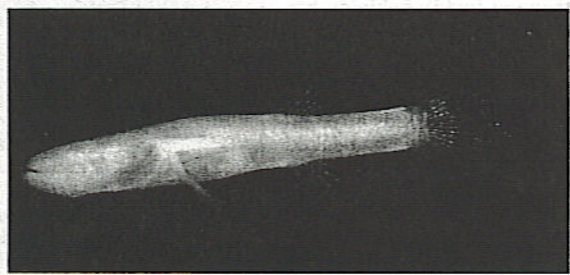
In a recent survey of the southern cavefish in Arkansas together with my students I found that there were very few individuals of this species visible in caves. The reason is that this is a fish that is found mostly in the water that fills the permeable underground rocks. Because the increasing agricultural, industrial and urbanization of many parts of Arkansas, we are dealing with a potentially serious problem.

An example of what may happen in Arkansas took place in November of 1981 at Maramec Spring, Mo. About 80,000 liters of liquid ammonia nitrate and urea fertilizer spilled at a pipeline break near Dry Fork Creek in the recharge area of that locality. For seven days following the break, dissolved oxygen at Maramec Spring, 21 kilometers from the break site, dropped so much that 37,000 fish were killed. The high concentration of ammonia and nitrate nitrogen remained elevated in the spring for more than 38 days. Among the organisms killed were 10,000 individuals of the rare Salem cave crayfish and about 1,000 individuals of the southern cavefish.

If we really want to preserve the underground jewels of The Natural State, it is essential that we start taking a look of what is going on above ground.

For more information, contact the Arkansas State University Department of Biological Sciences at biology@astate.edu.

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The southern cavefish has been found in only four locales in Arkansas. Its survival in the state depends upon the quality and quantity of underground waters.