

Salamanders, headwater streams critical in food chain

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University of Missouri scientist Ray Semlitsch studies creatures most people don't ever see. These creatures are active only at night and thrive in the shallow, cool, wet surroundings of headwater streams, an oft-overlooked biological environment.

A collaborative study, with MU graduate student Bill Peterman, recently published in the journal *Freshwater Biology*, revealed the biomass (total mass of an organism in an area) of the black-bellied salamander far exceeds any previous estimates, and the contribution of the species and its habitat may be critical in the food chain.

While the ecological role of the salamander is not fully understood, radio-telemetry and mark-recapture tracking methods used in the study indicate the salamanders are a critical component in the productivity of headwater streams, possibly ensuring the survival of other species of fauna.

“This is important because it is the first study to uncover the hidden biomass of these salamanders,” said Semlitsch, professor of biological science in the MU College of Arts and Science. “Salamanders typically live underground. They live in places most people don't see, and they live in these small, headwater streams where there are no other fresh-water vertebrates. Fish can't exist in these small streams. This is where water seeps out of the rock, where all streams begin life as a stream.”

These headwater streams, according to the study, are very productive

areas for salamanders and Semlitsch advocates the protection of these ecosystems.

“The final ‘take-home’ message of our study is salamanders comprise a huge amount of protein biomass for these headwater stream ecosystems,” Semlitsch said. “We think that’s important because that biomass can then be used by consumers, such as predators, or could be used by decomposers in that system. The salamanders also are consuming aquatic insects. They are a key link, we think, in these headwater stream systems that has not been detected or uncovered before.

“The amount of biomass we’ve reported is much, much higher than has ever been reported before, suggesting these headwater streams are very important ecosystems and they deserve protection. In my view, they actually deserve more protection than further down stream. It seems logical to me to protect the water where it’s coming out of the ground to retain and maintain clean water and provide ecosystem services downstream.”

Semlitsch said the study brings to light the critical importance of salamanders, creatures that most people don’t know much about or ever see as compared to birds or mammals.

Source: University of Missouri-Columbia

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