Spotted salamander

Photo courtesy: John J.D. Willson

Salamanders of Kentucky

by Steven J. Price

The temperature is hovering around 50°F, rain is pouring down in sheets, and it is 11:30 p.m. on a Tuesday in early April. Most people are at home, warm in their beds. But I am not. I'm slowly driving the rural roads in southern Jessamine County searching for salamanders. To encounter salamanders in Kentucky, you have to be out when most when people are not–when the weather is miserable. During these cool, rainy nights, salamanders migrate by the thousands to wetlands, ponds, and streams to find mates. Other species move about during these conditions, seeking invertebrate prey among the dead leaves and logs on the forest floor. Peering through the rain, with the aid of a flashlight, I spot my first salamander of the night–a spotted salamander. At seven inches in length, the orange and yellow spots make it among the most beautiful salamanders found in Kentucky. A few feet from the spotted salamander I spot the long toes and bluish coloration of Jefferson's salamander. I encountered seven additional species and more than 100 individuals along this quarter-mile stretch of road in the next 20 minutes. Undoubtedly, hundreds of additional individuals were moving throughout the nearby forest.

Cave salamander

Photo courtesy: Steven J. Price

Most Kentuckians are unaware that salamanders are some of the most abundant vertebrates in the Commonwealth's woodlands. Researchers have found that some salamander populations exceed 1,600 individuals per square acre in forest land; within streams, there can be as many as one individual per square foot. Given their abundance, why are salamanders uncommonly encountered? Salamanders are amphibians, and warm temperatures and dry conditions result in overheating and water loss. Thus, most species spend daylight hours hidden underground or under rocks and decaying logs.

What salamander species are found here?

Kentucky is home to 35 species of salamanders. Many of Kentucky's salamanders are considered semi-aquatic; they require aquatic habitats, such as streams or wetlands, for reproduction and development and terrestrial habitats for foraging and overwintering. Examples of semi-aquatic species include eastern newt, spotted, Jefferson's, marbled, tiger, long-tailed, and red salamanders. All semi-aquatic species have a distinct larval stage similar to the tadpole seen in frogs, which undergoes metamorphosis to an adult form.

A few salamander species found in Kentucky are completely aquatic–that is they never leave the lakes and rivers they inhabit. The eastern hellbender, a two-foot long, fully aquatic

Photo courtesy: Jackie Guzy

Eastern Hellbender

salamander breathes entirely through its thick, fleshy folds of skin and lacks external gills. The eel-like, three-toed amphiuma is also completely aquatic and can reach approximately 4 feet in length, making it one of the longest species in North America. The ravine, zig-zag, green and slimy salamanders are completely terrestrial. Terrestrial species lay their eggs under rocks and logs in the forest, skipping the larval stage entirely. Many of Kentucky's salamanders, including all terrestrial species, lack lungs and respire entirely through their skin.

Salamander diversity varies throughout the Commonwealth. The Cumberland Plateau is home to 26 species, and many of Kentucky's salamanders are only found in this region. Species restricted to Eastern Kentucky include mountain dusky, Black Mountain, seal, Cumberland Plateau, and Wehrle's salamanders. The Jackson Purchase or Mississippian Embayment in Western Kentucky also has a few salamander species, such as the three-lined and mole salamanders, which are rare in other parts of the Commonwealth. The Western Coal Field and Bluegrass regions have the fewest salamander species, although the northern redback salamander can only found in the Bluegrass, and streamside salamanders appear to reach their greatest densities in the Bluegrass region.

How are salamander populations doing in Kentucky?

Factors such urbanization, mining, timber harvest, draining of wetlands, siltation of streams, pollution from agriculture and lawns, invasive species, overcollection (especially for fish bait), and disease have definitely resulted in salamander population decline throughout the Southeastern United States and likely impact Kentucky's salamander populations. Indeed, recent survey efforts have shown a significant decrease in dusky salamanders in some areas of Kentucky. Why should we care about salamanders? Their dietary preference for invertebrates coupled with their exceptional densities suggests an obvious benefit to residents of the Commonwealth; salamanders likely consume millions of insects each year. Furthermore, salamanders serve as prey for reptiles, birds, and mammals. Additionally, several researchers have suggested that salamander populations can indicate the overall condition of the environment. Their thin, permeable skin allows pollutants to enter freely. Keep this in mind: If water flowing through Kentucky streams is not clean enough to support salamander populations, it probably isn't clean enough to support human populations.

How can we manage for salamanders on forest lands in Kentucky?

Moist and cool conditions in many of Kentucky's forests provide favorable habitat for salamanders, especially if wetlands, seeps, streams, caves, and talus slopes are embedded within the forest. In woodlands, several management techniques can be used to maintain salamander populations. Most importantly, timber harvests should be minimized within or adjacent to wetlands, streams, and ravines. Meeting or exceeding Kentucky Streamside Management Zones (SMZs) is highly recommended. Secondly, partial harvesting as opposed to clear-cutting a woodlot will reduce harvest-related population declines; allowing dead trees and woody debris to decompose naturally creates habitat for salamanders on the forest floor. Third, minimize soil disturbance and compaction; most salamander species spend the majority of their lives underground or under debris on the forest floor. Minimizing soil disturbance also prevents sediments from running into streams and wetlands. Finally, when using pesticides and/or fertilizers near wetlands and streams, always carefully follow instructions prior to application and only use those products that do not cause harm to aquatic organisms. These management techniques will not only benefit salamanders, but other wildlife found in Kentucky forests.

Photo courtesy: Kristen Cecala

Southern two-lined salamander

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