

Stream Salamander Monitoring Project

What and Why?

Great Smoky Mountains National Park is known as the salamander capital of the world. The park's varied topography, coupled with high rainfall, has created ideal conditions for over thirty-one species of salamanders to thrive. The sheer biomass, or weight, of salamanders is so great that if you were to take all the salamanders in the park, they would outweigh all the birds in the park – in fact, they would even outweigh all the mammals in the park! Salamanders are sensitive to changes in their environment and are relatively long-lived, with most species living 7-10 years, while some higher elevation species can live >25 years. The hellbender, the largest salamander in North America, which has healthy populations in the park, can live >40 years. Because of these traits, salamanders make ideal bioindicators; if their numbers start to decrease, it may be a sign that the salamander's environment, and therefore our own environment, is unhealthy.

To better understand and monitor the monthly, seasonal, and annual variations in the stream salamander populations in Walker Valley, we have been monitoring streams and salamanders since 1999. Because the salamanders are charismatic megafauna of the Smokies, this is a popular student research project, and volunteers can do this project without direct supervision after just a few training sessions. School groups can also participate.

Monitoring salamander populations was one of the first projects proposed for the Citizen Science Program at Tremont. A college group from UNC-Chapel Hill (Dr. Haven Wiley) has driven the Heintooga—Round Bottom Road every September for over 25 years capturing and counting woodland salamanders in a very general way looking at hybrid zone for two species of the *Plethodon jordani* complex as well as population levels. This data, though simple and rough in methodology, is unsurpassed as a long-term salamander data set. We hope to be able to say the same about ours in time.

We put out the first Pauley Bags (“leaf litter bags” or “artificial habitats” made from plastic netting) in the Dorsey Branch in August 1999. Subsequent 100 meter transects of 21 bags each were put out in five additional streams at Tremont. Teams of students (either volunteer groups or school groups) visit the bags to identify, weigh, and measure the salamanders once per month (some take off the cold months of December through March and others just use rubber gloves to keep their hands from getting cold and wet). This data is then compiled and entered into a database. It is hoped that after several years of monitoring, we can begin to determine population trends of salamanders. The results can then be compiled into a peer-reviewed research paper that will aid park managers and salamander researchers in understanding this fascinating group of fauna.