Introducing Leslie Bishop, Staff Scientist

Leslie Bishop is a retired professor of biology from Earlham College in Richmond, Indiana, where she taught courses such as Invertebrate Zoology, Insect Biology, and Biological Diversity, for over 20 years. After retirement, she taught Wildlife Ecology in Tanzania, and Biodiversity in Dominica as a Fulbright Scholar. Given her interest in raising awareness about the conservation of biodiversity, and her active volunteering with IFA's Ecoblitz, IFA Executive DIrector Jeff Stant invited Dr. Bishop to work for IFA on research and advocacy efforts, thanks to the support of an anonymous donor. Whether she's testifying for pro-forest legislation, in the field studying spider life, or observing the impacts of logging near her Brown County home, Dr. Bishop is an eloquent voice in the effort to preserve Indiana State Forests. Leslie Bishop, Ph.D. Photo by Jeff Hyman.

The first question I am asked when I meet new people is "Why do you study spiders?" My immediate response is to explain that spiders are fascinating in every way--their incredible diversity of lifestyles, their innovative ways of catching prey, and their amazing ability to produce and use silk. And if the person has an hour to spare, I will explain the ecological importance of spiders. For example, spiders are important in terrestrial ecosystems as first-level predators in the food web. A recent study estimates that globally spiders eat up to 800 tons of insects per year, which is comparable to the yearly tonnage of food eaten by all whale species!

Spiders are an important component of forest ecosystems. They can be found in microhabitats ranging from the forest floor to the forest canopy, and have diverse lifestyles: from hunters who run down their prey, to others who ambush their prey, to web builders. Although there is much information in the literature about mammals and birds in forest ecosystems, little is known about forest spiders despite their important functional role. In fact, there is a paucity of information about spiders in Indiana for all habitats. Yet in many biodiversity studies, spiders are considered good indicators of arthropod diversity due to their spatial ranges (they can be found on the ground, air, water, etc.) and temporal ranges (they are active in multiple seasons, times of day, etc.).

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For the past three years I have participated in the IFA Ecoblitz in the Morgan-Monroe/ Yellowwood State Forests as leader of the spider team. Each year we sampled spiders both early in the season (June) and late (September) to identify spiders of varying life histories. We also included both day and night samples to find spiders with different activity periods. For each sample, we focused on three habitats: dry ridges, slopes that are neither wet nor dry, and bottomland with a creek bed.

To find spiders, we look high and low--among plants, on tree trunks, and under stones and rotting logs. We also sort through samples of leaf litter to find tiny spiders that live on the forest floor. Spiders are not easy to identify; there is no field key as there is for birds. We have to take our specimens to our labs where we look at them closely under the microscope and identify them using taxonomic keys from the primary scientific literature.

Wolf spiders are ground hunters who do not build webs to capture prey. Photo by Brian Foster.

To date, we have identified a total of 122 species from 28 spider families. Not only do we keep adding new species to the total list each year (2014: 76 species; 2015: 100 species; 2016: 122 species), but we also add new families. This tells me that we are far from a complete list of forest spider species. In fact, we have collected 22 species from this interior forest that are new records, never before seen in Indiana! Our study reinforces the importance of night collecting--35% of our spider species are from night collection only.

The understanding of the diversity of spiders is in its infancy. Scientists have described about 43,000 species of spiders globally, and Norman Platnick, an expert from the American Museum of Natural History, estimates that just as many remain to be discovered. Our mature mixed-deciduous forests in south central Indiana are host to a rich diversity of spiders. My colleague, Marc Milne, has already found five new spider species from Indiana forests. Who knows how many more are waiting to be discovered! ♦