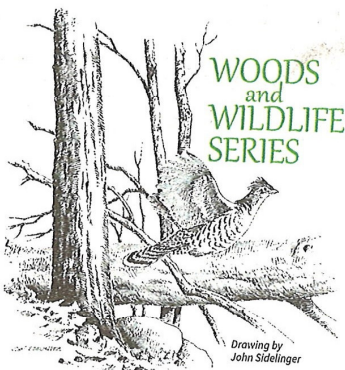


Ticktock...Ticktock...It's Time!

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This article is part of a series exploring animals and their dependency on forests. Each article blends personal experiences with factual information and will challenge you to look closely in your woodlot for evidence that you are a habitat provider for wildlife species.

The clock is ticking if you find a tick on you, but the Tick Research Lab of Pennsylvania offers free identification and testing and will give you an official lab analysis by identifying the tick and testing it to see what diseases it might carry. You can also send a photo of a tick to the lab for free identification. The directions are on the website, but here's a summary:¹

Remove the tick: Grasp the tick with tweezers where it's attached to the skin and carefully, slowly pull it off without twisting. Don't put anything on the tick. Place the tick in a clean, sealable plastic bag and send it to the lab. Don't put anything else in the bag. Immediately clean the bite area with antiseptic, such as rubbing alcohol.

Worried about your dog, cat, or horse? The Tick Lab will also test ticks found on those animals.

Order a FREE tick test: Go to www.ticklab.org to request the free test and fill out a questionnaire, which then provides a receipt. If possible, provide a cell phone number and an email so the lab can text and email the results to you.

If you can't print the receipt (also referred to as a voucher), you can write all the information needed on a slip of paper and include it in the envelope.

The basic panel test is only free to Pennsylvania residents. Non-PA residents must pay \$50.

Mail the bagged tick and the receipt:

Place the bagged tick and the paper receipt in a business-sized envelope and mail via certified USPS mail to the lab. Don't request a signature, since that could delay delivery. Mail to:

Tick Lab
Suite 114
562 Independence Road
East Stroudsburg, PA 18301

If you live near the Tick Lab, there is a drop box at the Innovation Center in East Stroudsburg.

Wait for the results: The lab pledges to send your test results within three business days after receiving your tick; they are not open on weekends.

This is truly a fantastic service for forest landowners and others who spend a lot of time outside, since so many of us are in "tick territory" when we are out in the woods. Both Mike and I used the service this year since we found attached ticks on us.

Results: The lab first texted us the identity of the tick. In Mike's case, it was an "adult female deer tick unengorged with blood"...and "likely not attached for more than 7 hours, based on its body size." Deer ticks are also called black-legged ticks.

When we discovered the tick on Mike, it was deeply embedded in his upper arm, so we were surprised that it was unengorged, meaning the tick had not yet started to feed.

In my case, I received a text stating the tick on my neck was an "adult female American dog tick unengorged with blood."



The deer tick, also called the blacklegged tick, is only about the size of a sesame seed, but can transmit the pathogen that causes Lyme disease. This tick is actively feeding on its human host.

It took a few more days to get the email with my test results, but we were impressed how quickly we were notified.

We were lucky, since feeding allows disease transmission. And that's the other amazing service: the Research Lab conducted a free basic panel of tests to determine the pathogens present in the tick.

In Mike's case, since he hosted a deer tick, the lab tested for nine different pathogens, including *Borelia burgdorferi*, the bacteria that causes Lyme disease. Other pathogens cause a host of various diseases, such as babesiosis, human and animal anaplasmosis, and two types of viruses. Mike was double lucky—the tick tested negative for all the pathogens that cause these diseases.



American dog ticks don't carry Lyme disease, but the lab still checks for the pathogen, as well as other diseases that it could carry. This tick species is the largest one found in Pennsylvania.

Since I found an attached American dog tick, the lab checked for these diseases: Lyme disease, human monocytic ehrlichiosis, tularemia, Powassan virus General, Rocky Mountain spotted fever, and the same two types of viruses in the deer tick. All the results were negative.

If the ticks were engorged, an option for additional pathogen testing is available, for a cost that certainly seems reasonable. If the first round of testing showed a number of pathogens present, we could have requested additional disease tests. The lab keeps the tick's DNA on file for two years.

If we had gotten positive results from the lab, our next step would be to share

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the results with our personal care provider to discuss the risk of exposure and any clinical treatment that might be needed. The lab offers a disclaimer that the test result does not rule out or confirm the presence of the agent or exposure to the patient, but states the tests are 99.9% accurate.

Tick-transmitted diseases: The Tick Lab website also has an excellent section on tick-borne diseases, including how long it may take the pathogen to be transmitted from the tick to a person. According to the lab, transmission time for the bacteria that cause Lyme disease is 18 to 24 hours, but the deer tick virus can be transmitted in just 15 minutes!

Tick species: There are a number of different tick species, and it's helpful to learn how to identify them. The Mayo Clinic illustrates different ticks found in the U.S., their range, and the pathogens they could carry. Very importantly, study the section on "Preventing Tick Bites."²

The Pennsylvania Department of Environmental Protection (DEP) website has even more specific information on ticks, including maps that show Pennsylvania counties where the DEP has collected different species of ticks. Search for "DEP and ticks," then scroll down to Distribution Maps.³

Fascinating data: The Tick Lab website shows lots of data about ticks which is updated daily.

When I checked, the lab had tested 422 ticks from Bedford County, where we live with ticks. Of the ticks tested, 68% were uninfected, meaning no pathogens were detected. In Chester County, almost 4,000 ticks have been tested, 80% were uninfected. Only 153 ticks have been tested in our neighboring Fulton County, with 77% uninfected. Word about the lab has spread in Monroe County, where East Stroudsburg is located. Almost 5,000 ticks have been tested in that county, with 73% uninfected. I didn't check all the counties, but one county with a higher rate of infection was Cameron County: 51% of the 74 ticks tested were positive for infection. Statewide, 84,428 ticks have been tested using the basic panel, with 71% of the ticks uninfected.

Another page with pie charts for Pennsylvania shows how the various levels of testing reveal the number of pathogens per tick over the past five years. All levels of testing show that most ticks are uninfected, and, while most people (78,787) just get the

free basic panel of tests, about 1,500 people paid for the advanced test, and almost 2,500 people paid even more for the comprehensive panel. The comprehensive panel test results showed that 27% of the ticks were infected with just one pathogen, while 132 had two pathogens, 30 had three pathogens, and eight ticks were infected with four pathogens. Note that this data is "live," so the webpage is updated on a regular basis.

Lyme disease: I've had Lyme disease three times, but the common bull's eye rash only appeared the last time. Mike has never had Lyme disease—he's too ornery, he maintains! I was bitten in June 2002 but didn't realize it was a tick bite and the symptoms didn't appear until about two months later when I suffered extreme fatigue and malaise—it was difficult to do anything that required even a little bit of energy. The doctor prescribed a combination of doxycycline and amoxicillin for two weeks, which was very effective.

In the spring of 2009, I was teaching at Bedford Elementary's Environmental Education Center in prime tick habitat, so I scheduled tick programs for all teachers and students the last week of school. Ironically, I contacted Lyme disease three days before I could start the programs. This time the lethargy was accompanied by a severe migraine, so the "Tick Talks" were cancelled.

The third time, in the spring of 2015, I removed an embedded deer tick, but a bull's eye rash developed around the bite



An early sign of Lyme disease is a bull's eye rash, but not everyone develops this symptom. Some bull's eye rashes are very large, and some people develop more than one as the bacteria moves through the person. Other health issues may also cause a bull's eye rash: ringworm, hives, etc.

site, so I knew I contracted Lyme disease again!

I don't seem to have any chronic problems caused by Lyme disease since I took antibiotics each time, but many people suffer from long-term effects, called chronic Lyme disease. My younger sister suffered symptoms from chronic Lyme disease for over 30 years before she was diagnosed and treated, but she died a few years later from glioblastoma (brain cancer). Did the bacteria that cause Lyme disease also cause her cancer? Was her Lyme disease a misdiagnosis? We don't know the answers, but we are glad research is ongoing to understand the myriad health impacts of the bacteria that cause Lyme disease.

Alpha-gal Syndrome: One thing we do know: a bite from the lone star tick can sometimes lead to alpha-gal syndrome. A friend of ours claims she was "stalked" and bitten by a lone star tick while on a birding trip to Texas. Stalked? Yes, this tick species moves quickly when searching for a host. The name is based on the white spot (like a single star) on the back of the adult female tick—the males and nymphs don't have this mark. Some lone star ticks carry a sugar molecule called alpha-gal that is absent in humans, so if the alpha-gal is transferred during feeding, the sugar molecule can trigger an immune reaction.² Some people have a mild reaction such as hives or itchiness, but it can be life-threatening in others. Oddly enough, the allergic reaction occurs if the person eats red meat (beef, pork, lamb), but not poultry or fish. Some people, like our friend, are so sensitive that they need to avoid dairy and gelatin, too. Although she is very careful to avoid red meat, she still suffers severe digestive issues associated with alpha-gal syndrome.

As our climate warms, lone star ticks are spreading into Pennsylvania, and tick populations are increasing. Ticks play an important role in nature, but let's be tick smart so they don't get on us. If they do, send them to the Tick Lab.

References:

- ¹ <https://www.ticklab.org>
- ² <https://www.mayoclinic.org/diseases-conditions/alpha-gal-syndrome/in-depth/tick-species/art-20546861>
- ³ <https://www.dep.pa.gov/Business/ProgramIntegration/Vector-Management/Ticks/Pages/default.aspx>