Tick Awareness: Making Your Immediate Environment Safer

By now, we all know to keep our lawns closely mowed and free of tall grasses, encouraging sunny open grassy areas that are unattractive to ticks. Raking up those wet decaying leaves that gather in the fall also help, but you can do even more to ascertain that your environment is safer for your children, pets and for yourself.

The recent and continual rise in the number of ticks in New York State has brought with it an increase in the incidence of the diseases the tick carries. The New York State Department of Health reports that Lyme disease is the most commonly reported tick-borne disease in the state, with over 7,000 cases reported each year. This steady change has been attributed to a number of factors. Climate warming, an increase in deer populations, as well as the proliferation of non-native invasive shrubs, are only a few reasons why more lake residents have recently been plagued by tick bites.

The list below shows the number of cases and incidence of Lyme Disease in Steuben and adjacent counties, as reported in 2016 and 2017 respectively, by the Departments of Health in New York State and Pennsylvania. Unfortunately, more recent data has not yet been published.

Steuben:	68 cases	69.7 cases in 100,000
Allegheny:	4 cases	8.4 cases in 100,000
Livingston:	3 cases	4.6 cases in 100,000
Ontario:	21 cases	19.2 cases in 100,000
Yates:	16 cases	63.9 cases in 100,000
Schuyler:	20 cases	110 cases in 100,000
Chemung:	94 cases	108 cases in 100,000
Tioga (PA):	85 cases	150-349.9 in 100,000
Potter (PA):	48 cases	150-349.9 in 100,000

Ticks love warm wet environments and as sustained warmer temperatures extend north and west and to higher elevations, ticks march further in those directions. Winter temperatures historically have been sub-optimal for tick reproduction which usually decreases or ceases during colder months. However, the onset of milder winters has allowed more ticks not only to survive, but to reproduce during the “off season”. On the other hand, it is unlikely that the spread of Lyme Disease to the South is attributable to climate change.

The number of nymphs infected with Lyme are linked to the size of mouse populations. Larval ticks aren’t born with the bacterium that cause Lyme. Newly hatched larvae feast on infected hosts and carry it to their next host. White-footed mice, eastern chipmunks and short-tailed shrews are the main hosts that infect black legged ticks with the bacteria and parasite that cause Lyme disease, anaplasmosis, and babesiosis. All three of the responsible pathogens can be picked up by a feeding tick from a single

host. Subsequently, ticks can have as many as three more different hosts in their life time.

Half of all adult ticks and 25% of nymphs carry the bacteria which cause Lyme. Although many tick bites resulting in infection are inflicted by adult females, nymphs infected with Lyme pose the greatest risk to humans. Eighty percent of Lyme cases in New York State have been attributed to the nymph which is more difficult to spot on the body because of its extremely small size.

In addition to small mammals, an overpopulation of deer in many northeastern states may be responsible for the increase in ticks. The lack of natural predators, a 20 year decline in deer hunting and excessive land development all contribute to the overpopulation. Unfortunately, more deer mean more ticks, resulting in more eggs laid, since ticks also feed upon deer. Although hunting increased in the 1980's, and during the COVID pandemic, the number of hunters continue to decline as baby boomers, who make up most of U.S. deer hunters, age. Deer are also showing up in startling numbers in many suburban areas which further pose a risk to public health.

Birds, amphibians, reptiles, squirrels and raccoons also carry ticks. It is notable that birds have the potential to carry ticks further than deer or rodents since their geographic range is larger. However, birds are more likely to carry the bacteria that cause Lyme disease rather than the microbes responsible for anaplasmosis or babesiosis.

It's not only the climate and animals that are causing havoc by increasing tick borne diseases. The Japanese Barberry shrub, which is common in the Northeast, is a magnet for the adult black legged tick which not only causes Lyme Disease, babesiosis and anaplasmosis, but ehrlichiosis and Powassan encephalitis. A 2013 Special Bulletin published by the University of Connecticut and the Connecticut Agricultural Experiment Station states that the density of ticks carrying *Borrelia burgdorferi*, the bacteria which causes Lyme Disease, is 120 ticks per acre in a barberry-infested forrest vs. 10 ticks per acre in a forrest without Japanese Barberry.

The Japanese Barberry shrub has been a desirable landscaping choice for unsuspecting homeowners for decades. It is attractive to homeowners because it is deer resistant, easy to maintain and can grow into six foot thick hedges which provide homeowners with desired privacy. The plant thrives in early spring and late fall, in shady and sunny areas alike and is adaptive to diverse climates. Visibly attractive, the shrub has small spoon-shaped, shiny green leaves bearing bright red oval berries and small prickly spines in the summer, with leaves that turn red in the fall. However, the plant is extremely invasive. Their branches take root easily when they come in contact with the soil. They are reported to change the pH of the soil, making it more conducive to their growth. In addition, birds and deer disperse their seeds, further encouraging growth. While the Barberry shrubs grow, the number of native plants decreases. Because the Japanese Barberry is deer resistant, deer eat only the small number of native plants that remain, which further negatively impacts the ecosystem.

Removing these shrubs by mechanical, chemical and manual methods is effective but labor intensive. Detailed information on these methods of removal is available from the University of Connecticut and the Connecticut Agricultural Experiment Station at https://portal.ct.gov/-/media/CAES/DOCUMENTS/Publications/Special_Bulletins/SpecialBulletinFeb2013Wardpdf.pdf. There are multiple resources available on line which address smaller scale removal from one's yard.

Ticks generally dislike hot and dry. If your property is surrounded by forests, providing a three foot wide barrier of mulch consisting of broad dry wood chips around the perimeter of your yard may help prevent ticks. Planting marigolds in your yard which emit a smell that many insects find repulsive may also help. Rosemary, mint, garlic, lemongrass, eucalyptus and sage are reported to emit toxins and oils that can repel ticks. Bagging grass clippings rather than allowing them to remain on your lawn will also reduce tick habitats.

Summer months afford us with the opportunity to enjoy revitalizing and carefree time in nature. Having to worry about ticks and Lyme Disease doesn't have to be a deterrent when simple effective strategies can help you avoid tick encounters. Wearing permethrin-treated clothing, tucking long sleeve tee shirts into pants and pant legs into socks and using insect repellants can reduce your risk. Being aware of our everyday habits which impact our environment in the short and long term can also go a long way to reduce the ecological impacts which foster increases in tick populations.

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References Available Upon Request