

Community IPM

Understanding and Managing Ticks – A Guide for Schools, Child Care and Camps

Ticks are tiny, blood-feeding arthropods closely related to spiders and mites. With the ability to feed on a variety of hosts, ticks can be found in many environments—shoreline, forest, farm, field, and playground. On school and child care facilities, they may be found on school yards located in and around wooded areas, paths, and cross-country trails.

Ticks are a public health risk because they feed on the blood of humans and other animals, and can transmit several diseases, including Lyme disease. Awareness and a little precaution can help you steer clear of tick-borne illness and the discomfort of being bitten by ticks.

Did You Know...?

- **Historic hatred:** Aristotle, Cato, and Pliny referred to ticks as “disgusting parasites”.
- **By the numbers:** There are 671 species of hard-bodied ticks and 167 species of soft-bodied ticks worldwide. There are four major species of ticks in New York.
- **Frost resistant:** As long as the temperature is above freezing, ticks can be on the move. Even on those warm January days, be sure to protect yourself from ticks.
- **No jumping, dropping, or flying:** Ticks quest, which means they stand at the tips of grass or ends of branches and wave their front claws in the air, waiting for a host—human or animal—to brush by.
- **Taking their time:** Finding a tick on a child is not proof that the tick came from the school or child care property. Ticks may wait several hours before attaching, and then can take another two hours to insert their mouthparts. There is, however, no established minimum time that it takes to transmit diseases after attachment.
- **Tweezers are best!** Use fine-pointed tweezers to grab the tick as close to the skin as possible and pull straight up until the tick releases. Grab it too high, or using other methods such as matches, nail polish, or petroleum jelly, could irritate the tick, causing it to regurgitate its disease-ridden stomach contents directly into your blood stream.



Questing tick. Photo: Jim Occi, BugPics, Bugwood.org



Note the size difference between the different life stages of the deer tick. Thankfully, the smallest ones, called larvae, are incapable of transmitting disease. Photo: Fairfax County



The goal is to avoid any engorged ticks. Photo: Scott Bauer, USDA Agricultural Research Service, Bugwood.org

Species	Habitat	Primary Hosts	Human disease capability	Notes
 <p>Blacklegged (deer) tick, <i>Ixodes scapularis</i></p>	Forest-field edge, Forest leaf litter, Trails in natural areas, Overgrown or brushy areas	White-footed mouse White-tailed deer Birds	Lyme Disease Anaplasmosis Babesiosis	<ul style="list-style-type: none"> The smallest NE tick. Nymphs, which can transmit disease, are as small as the point of a sharpened pencil. Two year life cycle 2,000 - 3,000 eggs 3 - 7 days to ingest blood, depending on stage Require high humidity to survive
 <p>Dog (wood) tick, <i>Dermacentor variabilis</i></p>	Grassy fields, Overgrown or bushy areas, Roadsides, Marshy areas, Brushy woodlands	Nymphs & larvae: small rodents Adults: dogs & other medium to large mammals	Rocky Mountain spotted fever Tularemia STARI borreliosis Tick paralysis	<ul style="list-style-type: none"> The largest NE tick. An adult is about 6.4 mm and a fully engorged female reaches 13 mm. 3,000 - 7,000 eggs
 <p>Lone star tick, <i>Amblyomma americanum</i></p>	Woodlands	Wide host range	Ehrlichiosis Rocky Mountain spotted fever Tularemia STARI borreliosis	<ul style="list-style-type: none"> The long mouthparts can inflict a painful bite. 1,000 - 8,000 eggs (3,000 average)
 <p>Brown dog (kennel) tick, <i>Rhipicephalus sanguineus</i></p>	Yards, Homes, Kennels, Small animal hospitals, In NE, found almost exclusively indoors	Dogs	Ehrlichiosis Canine babesiosis Rocky Mountain spotted fever	<ul style="list-style-type: none"> 360 - 3,000 eggs

Identification

Ticks can be tricky to identify because (1) their sizes vary between different life stages, (2) males and females do not look alike, and (3) the size of larvae, nymphs, and adult females depends on how much blood they have ingested. All, however, have two body parts and eight legs as nymphs and adults. Larvae have only six legs. Ticks typically have a flattened appearance except when engorged on a blood meal, at which point they can take on the appearance of a small gray raisin with legs.

Biology

While all ticks feed on blood, different species look different, can be found in different habitats, and pass on different diseases. For each species, different life stages will feed on different hosts, with larvae and nymphs attaching to small animals, such as mice, and adults attaching to larger animals, such as deer.

Management

The level of management (and justification for costs) should be determined by an active monitoring program to assess the risk of ticks and their hosts. Questions to ask and answer include:

- Are there areas of deer habitat (forests or fields) adjacent to the grounds?
- Are deer or turkey present on grounds?
- What type and how many ticks are found on the property?

Managing the risk for ticks falls under four primary management practices:

- 1. Personal protection:** When in areas suspected of having ticks, protective measures such as wearing light-colored pants and long-sleeved shirts, using tick repellents, and, most importantly, conducting tick checks after leaving tick habitats are the best protection against tick bites and disease transmission. Educate students, parents, and staff about personal protection.
- 2. Habitat modification:** Most tick species prefer high humidity, so look to reduce shady and damp areas in the play yard. Also look to eliminate habitat that attracts tick hosts. Replace plants that deer love to browse with deer resistant plants (Google “deer resistant plants Cornell”). Remove leaf litter from field edges near wooded or unmanaged areas. Avoid putting bird feeders in areas where children play. Avoid wood piles, stone walls or other structures that would shelter mice. Establish a three foot gravel buffer zone between wooded areas and fields.
- 3. Host exclusion:** In areas with high deer populations, installing a deer fence can help to reduce dispersal of ticks.
- 4. Chemical control:** Consider pesticide applications if risk is unacceptable, but be sure to follow the Child Safe Playing Fields Act. Permission for an emergency exemption will need to be granted by the appropriate entity. For specifics on the law, visit www.dec.ny.gov/chemical/41822.html.

Monitoring for ticks

The easiest way to look for ticks is by dragging or flagging. Attach dowels on the ends of a 3'x3' white flannel cloth to create your own tick drag. Drag the cloth over grass and brush and then identify and count the number of ticks clinging to the sheet. This should be done regularly, as tick populations fluctuate throughout the year.

Keep records of scouting results to determine whether the risk is increasing or decreasing, and gauge if management actions have been successful. When looking for an exemption under the Child Safe Playing Fields Act, proof of ticks will be needed.



Lyme disease is spread exclusively by the blacklegged tick and is the #1 vector disease in the United States. Photo: Scott Bauer/ Bugwood.org



Avoid wood piles, stone walls or other structures that would shelter mice close to where children play. Photo: David Cappart/Bugwood.org



White-tailed deer are the primary host and disperser of black-legged tick adults. Female ticks take a blood meal from deer in the fall and reproduce in the spring. Photo: NYS IPM Program

Disease transmission and risks

The most important and effective way to manage tick-borne diseases is to avoid being bitten. Many ticks can transmit several types of disease organisms, including Rocky Mountain spotted fever and ehrlichiosis. Lyme disease, which is spread by the blacklegged tick, is the most common tick-borne illness resulting in over 300,000 new infections each year in the US (US CDC). Lyme disease is caused by the bacterium *Borrelia burgdorferi*, which is transferred from a reservoir host to the saliva of a tick, and then to the blood of a human or other host. A reservoir host, such as the white-footed mouse or white-tailed deer, carries the bacterium without suffering any symptoms from the illness. Where these hosts are abundant, ticks and Lyme disease are usually present. In areas without deer, ticks may be much less abundant, even if white-footed mice are present. Lyme disease is most common in the Northeast and Great Lakes states.



The dense nature of the Japanese barberry provides a humid environment, perfect for ticks, along with food and shelter for its hosts – small mammals like mice. Photo: Satrina0



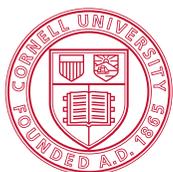
Dragging for ticks can help identify areas where ticks are located. Photo: Darryl Bautista/ Poughkeepsie Journal

Helpful Links

US Centers for Disease Control website	cdc.gov/lyme
TickEncounter Resource Center (University of Rhode Island)	tickencounter.org
Guidance Document on Child Safe Playing Fields Act	www.dec.ny.gov/docs/materials_minerals_pdf/guidanceech85.pdf
School IPM Action Plan for Eastern U.S. Ticks	extension.org/pages/24666/ipm-action-plan-for-eastern-us-ticks
Tick Identification	tickencounter.org/tick_identification

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