

**Title:** Reducing Impacts from Ticks in Home and Recreational Landscapes

**Project Leaders:** Kristina Ferrare, Forestry, Agriculture, & 4-H Team Coordinator at CCE Onondaga (CCE-OC) has participated in several deer management in-service trainings through Cornell University, and is a member of the nascent Lyme Disease & Deer Tick Management Task Force in Onondaga County. Kristina regularly uses principles of IPM to advise homeowners on managing tree health issues. Jessi Lyons, Environment & Community Vitality Team Coordinator at CCE-OC works extensively on invasive species management programs with an emphasis on IPM. She recently coordinated the establishment of a HWA biological control insectary in partnership with Mark Whitmore of Cornell University. She also delivers IPM education through EAB outreach programs, and horticulture consumer calls.

**Cooperator(s):** Dr. Jody Gangloff-Kaufmann, Coordinator Community IPM, NYS IPM; Joellen Lampman, NYS IPM, School and Turfgrass IPM Extension Support Specialist Program; Brian Underwood, PhD., USGS-Patuxent Wildlife Research Center and SUNY-ESF Kathleen Turner, Onondaga County Department of Health; Quoc Nguyen, M.D., Medical Director of the Onondaga County Health Department; Christine Manchester, Town of Dewitt. Mariette DeWolf, Jewish Community Center of Syracuse.

**Abstract:**

The population of ticks and incidence of tick-borne illness in Central New York has increased dramatically in recent years. Popular state recreation areas were identified as hyperendemic with Lyme disease in 2014. Deer carrying infected ticks are commonly found in urbanized areas in the City of Syracuse and surrounding suburban areas. A coordinated education effort was needed to inform the public about how to reduce tick exposure in residential and recreational landscapes, how to identify ticks and symptoms of tick-borne illness. This project sought to increase public knowledge about IPM approaches to reduce tick exposure through: public presentations, direct outreach at the NYS Fair and public events, public information displays at recreational sites, and informational and online surveys. Cornell Cooperative Extension of Onondaga County developed graphic educational materials and train-the-trainer workshops to expand outreach efforts and efficacy.

**Background and justification:**

Instances of tick-borne illnesses has increased in Central New York, in conjunction with increased deer pressure in urban and suburban settings. In 2014, more than half of adult ticks and 27% of nymphs tested, at popular Green Lakes State Park, were infected with the Lyme disease virus, giving the area the distinction of being hyper-endemic. In addition to the increasing tick populations and percentage of infection, the likelihood of human exposure to ticks is highest when ticks are most active and abundant, thus increasing likelihood of tick-borne illness transmission.

The Onondaga County Legislature convened a Lyme disease and Deer Tick Task Force in fall 2015 to address the issue of deer management and the prevalence of Lyme disease, and communities across the Central New York region are actively creating deer management plans. The political and public pressure to address management and Lyme disease has focused largely on reduction of deer populations, but has not addressed Integrated Pest Management approaches that would assist individuals in the short-term in residential landscape settings or in recreational

settings. The Onondaga County Health Department website offers information about tick removal and symptoms of detection and briefly addresses yard management and personal protective techniques, but expressed that there is a clear need for more direct IPM outreach and education, with more emphasis on cultural controls.

Creating less favorable habitat for ticks in areas where people live and recreate is an important means of reducing health impacts from ticks. The Connecticut Agriculture Experiment Station developed a “Tick Management Handbook” that comprehensively addresses IPM techniques in homes and landscapes with detailed and graphic explanations of cultural controls. NYS IPM also offers publications regarding ticks and IPM management of ticks. These publications could be supplemented with graphic illustrations of landscape strategies, making it easier for the public to understand where to make changes. A manual with comprehensive tick identification and disease symptom information could also increase consumer awareness and skills in tick identification and disease monitoring and serve as a tool for consumers and health care practitioners to properly identify ticks and their associated diseases.

CCE-OC has a large volunteer base and natural resource staff to develop, deliver and promote IPM methods to a local audience and state-wide visitors to Central New York. Our work in the County positions us at events that reach large numbers of the public and presents opportunities for educating individuals and groups on best practices that will have impacts beyond the local community. By leveraging our existing presence and role in the community, we can efficiently deliver the needed information about tick management and IPM and expand our public outreach through strategic delivery methods.

**Objectives:** State these the same as they appear on your original grant proposal.

1. Create a core of trained volunteers and staff that can provide community education around tick management and tick-borne illness prevention.
2. Increase community knowledge of threats from ticks, prevention techniques to reduce tick exposure, and methods to control tick populations in landscaped properties.
3. Project Evaluation will measure participant encounters and knowledge and behavior changes from outreach efforts.

**Procedures:** Methods and materials for each objective including the evaluation component.

1. Educator and master gardener volunteers researched and compiled relevant educational information on tick identification, diseases, life cycle, and (prevention in the landscape, personal safety, pesticides and how to remove a tick. This team of educator and volunteers developed a binder for each participant. The binder contained informative flyers and posters, a list of trustworthy websites to find out more information about ticks, a CD with digital copies of tick resources and a PowerPoint presentation to be used by attendees in giving talks to others, a full color tick identification booklet which was developed by CCE, and tick keys for removing ticks effectively. Tick samples were available at the event for observation. In addition, a presentation was given. Joellen Lampman from Integrated Pest Management spoke about tick biology, life cycle, tick borne illnesses, and techniques for reducing exposure to ticks such as personal behavior and dress, landscaping techniques, vector population management, and insect repellants. Kristina Ferrare of CCE-OC spoke on the tick monitoring efforts that CCE-OC is current engaged in. Nick Piedmonte of SUNY-ESF spoke about his research concerning local

tick population monitoring. Following the training, each participant took an evaluation survey that tested their knowledge on topics presented.

2. Participants increased knowledge of threats from ticks, prevention techniques to reduce tick exposure, and methods to control tick populations in landscaped properties through attending presentations, educational materials, (banner, posters, ID manuals, and an online survey.) Two large pull-up banners were created for use at the New York State Fair and other public events which reached over 5600 people. A train-the-trainer program taught 46 volunteers in-depth information about tick biology, disease transmission and avoidance, landscape management and personal behavior modification to limit exposure. The volunteers used the training to provide targeted education to school nurses, recreationalists, families, gardeners, and workers exposed to high-risk areas. Eight presentation were held to date and three more are planned for later this month and in April. A radio segment at Finger Lakes News Radio aired a clip on tick education, presented by a trained educator. The radio station had a listenership of over 6,000. Finally, an electronic survey was distributed as a means of simultaneously educating survey participants and evaluating the efficacy of the information material. 1,151 participants completed the survey with a mean score of 80%.
3. Project Evaluation will measure participant encounters and knowledge and behavior changes from outreach efforts. Over 1,000 participants completed the online survey. Many were intrigued by some of the answers and reached out wanting more information about the answers. Many found these surveys very informative and passed it along to others. One woman wrote “I thought your answers were so helpful...”

### **Results and Discussion:**

This project provided public information about IPM approaches to reduce tick exposure through public presentations, direct outreach at public events, public information displays at recreational sites, an in-depth train-the-trainer program, and informational surveys.

Two posters were created for public outreach; one focused on tick biology and reducing exposure to ticks in recreational areas and the other focused on home landscape management. Fifty waterproof posters were distributed to public recreation areas. 200 indoor posters will be shared with these sites, schools, landscaping businesses, and Cooperative Extension offices. A tick and tick-borne illness disease identification manual was created for educators, landscape managers, health care professionals, and Master Gardeners to assist with early identification of ticks and disease symptom awareness. Two large pull-up banners were created for use at the New York State Fair and other public events which reached over 5,600 people. The banners are now available for loan for other organizations to use for outreach. A train-the-trainer program taught 46 volunteers in-depth information about tick biology, disease transmission and avoidance, landscape management and personal behavior modification to limit exposure. The volunteers used the training to provide targeted education to school nurses, recreationalists, families, gardeners, and workers exposed to high-risk areas. In addition, the tick train the trainer event will result in a total of 10 additional presentations by end of April, eight presentations have been completed to date. A radio segment on ticks was aired by one of the train the trainer educators. Finally, an electronic survey was distributed as a means of simultaneously educating survey participants and evaluating the efficacy of the information material. 1,151 participants completed the survey and 30 received either tick removal keys or ID manuals as an incentive. These educational outreach opportunities trained and educated over 6,000 people.

Continued educational opportunities, such as presentations and panel discussions, will maintain the project's impact.

Educational materials developed during this project are integrated into the larger county-wide effort in communities to address deer overpopulation and associated issues.

**Project Locations:**

The presentations, tick train the trainer event, and NYS fair occurred in Onondaga County. The online survey reached many residents in Onondaga County and residents from Cortland, Cayuga, Albany, Schenectady, and Saratoga County. Many of these surveys reached other cooperative extensions, state parks, town and municipalities, and land conservation organizations.

**10. Samples of resources developed:**

See attached

Tick Recreation poster (A)

Home landscape poster (B)

Tick pull up banner (C)

Tick ID manual (D)

Online survey [https://cornell.qualtrics.com/SE/?SID=SV\\_4SkQ0bZgxIftUYR](https://cornell.qualtrics.com/SE/?SID=SV_4SkQ0bZgxIftUYR)

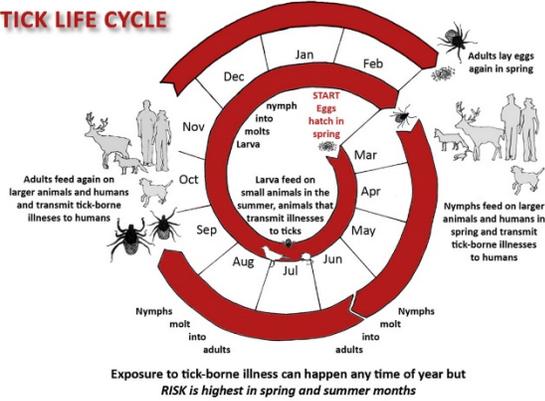
Website <http://cceonondaga.org/environment/invasive-nuisance-species/terrestrial-animals/ticks>

# TICKS

## Stay Safe Outdoors



### TICK LIFE CYCLE



### PROTECT YOURSELF

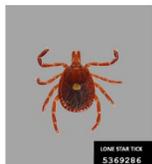
Take preventive measures against ticks year round. Be extra vigilant in warmer months (April-September) when ticks are most active.

- **Avoid tick habitat**
  - Walk on center of trails to avoid overhanging brush and debris
  - Avoid bushy areas with tall grass and leaf litter.
  - Avoid deer trails
- **Tuck your pants into your socks when hiking in the woods**
- **Use a pesticide such as Deet or permethrin**
- **Conduct routine tick checks**

### TICK - BORNE ILLNESSES



**Black-legged Ticks** can transmit *Lyme disease*, *Anaplasmosis*, *Babesiosis*, and the *Powassan (POW) virus*. Symptoms of *Lyme Disease* include fever, headache, weakness, and a skin rash characteristic of a bull's eye. If left untreated, *Lyme Disease* can cause long term joint pain and damage the nervous system. Symptoms of *Anaplasmosis* include fever, headaches, chills, and muscle aches that usually occurs within 1-2 weeks following the tick bite. *Babesiosis* infects red blood cells and many may not experience any symptoms but some may experience flu-like symptoms, fever, chills, sweats, headache, body aches, weakness, loss of appetite or nausea. Symptoms of *POW* include fever, headache, vomiting, weakness, confusion, seizures, and memory loss.



The **Lone Star Tick** causes *Ehrlichiosis*, *STARI* and *Tularemia*. Symptoms of *Ehrlichiosis* can include fever, headache, fatigue, and muscle aches. Symptoms can be seen 1-2 weeks following the symptom of *STARI rash illness*, is a Disease. See *Anaplasmosis* of *Tularemia*.



**American Dog Tick** causes *Tularemia* and *fever (RMSF)*. Symptoms depend on body but the most common is *fever*. See brown dog tick.

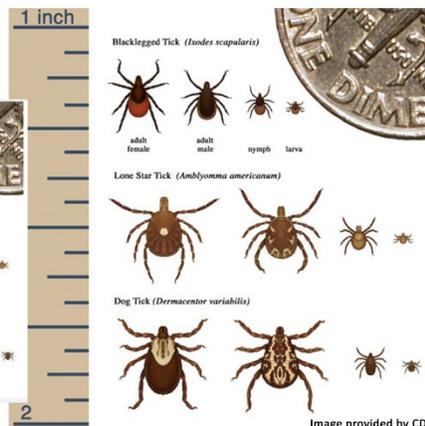


The **Brown Dog Tick** causes the *Rocky Mountain spotted fever (RMSF)*. Symptoms for *RMSF* can include fever, headache, vomiting, abdominal and muscle pain. If symptoms are not treated within the first few days, *RMSF* can be severe or even fatal.

### CONDUCT A ROUTINE TICK CHECK

- Check your clothing for ticks. Ticks may be carried into the house on clothing. Placing clothes into a dryer on high heat for at least one hour will effectively kill ticks.
- Check your body for ticks after being outdoors. Use a hand-held or full-length mirror to view all parts of your body.
- Showering within two hours of coming indoors has been shown to reduce your risk of getting tick-borne illnesses.

### SIZE COMPARISONS OF TICKS



Most ticks go through four stages in its life span. At each stage, ticks feed on a host in order survive. Most ticks can live up to three years. The diagram above gives a relative size comparison of ticks at its various life stage and in comparison with other tick species.

Image No. 1324009  
 Citation: Scott Bauer, USDA Agricultural Research Service, Bugwood.org  
 Susan Ellis, USDA APHIS FPH, Bugwood.org  
 Gary Alpert, Harvard University, Bugwood.org  
 Alex Pavlovski-Correa, Fundaçao Oswaldo Cruz, Bugwood.org  
 Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org



Cornell University  
 Cooperative Extension  
 Onondaga County

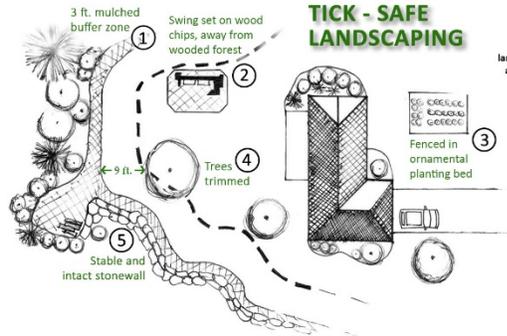
# TICKS

## Create a Tick Safe Zone

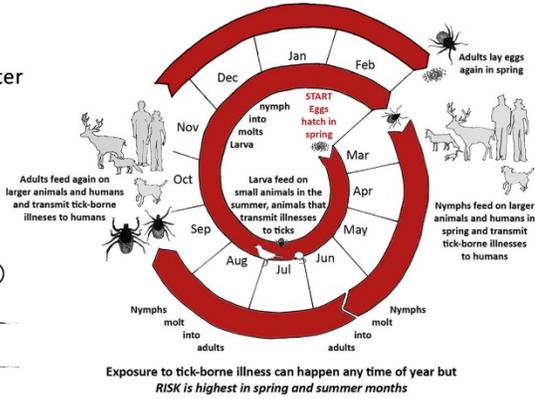


### DID YOU KNOW

- Over 80% of ticks are located in the transitional edge between woods and lawn?
- Children ages 5-13 playing outdoors are at greater risk for tick bites and Lyme disease.



### TICK LIFE CYCLE



### MINIMIZE INTERACTIONS WITH TICKS

1. Reduce interactions with ticks by creating a 3 foot or greater buffer from wooded edges.
2. Move children's play area away from wooded areas and place on wood chips or sand to reduce exposure to ticks.
3. Fencing off ornamental plant and vegetable beds can reduce interactions with deer transporting ticks.
4. Rodents transmit illnesses to ticks. Clean and seal stonewalls to discourage rodent activity. Doing so will reduce opportunities for rodents to linger.
5. Mulch planting beds around the house and trim branches and shrubs to let in light and air. Avoid creating conditions that ticks favor such as ground covers, leaf litter, and dark and humid spaces (seen in image 5).



Distance yourself from ticks. Create a 3 foot or greater wood chip or gravel border between wooded edges, stonewall and lawn areas.



Place children's play area on wood chips or sand.



Minimize interaction with deer by fencing off plant and vegetable beds.



AVOID stonewalls with small openings that could harbor rodents.



AVOID creating conditions that ticks favor.

Image No. 155009 Citation: Scott Bauer, USDA Agricultural Research Service, Bugwood.org  
 5369286 Susan Ellis, USDA APHIS PPD, Bugwood.org  
 5302289 Gary Apsport, Harvard University, Bugwood.org  
 5384587 Alan Pavesi de'Carria, Fundação Ornamental Cruz, Bugwood.org  
 5423496 Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org  
 1 Kirby C. Spafford III, Connecticut Agricultural Experiment Station, New Haven, Tick Management Handbook

# TICKS

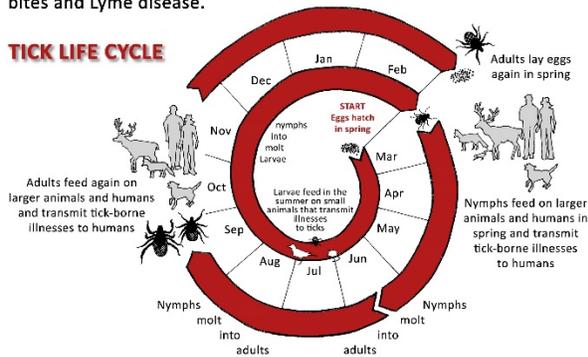
## Create a Tick Safe Zone



### DID YOU KNOW

- Over 80% of ticks are located in the transitional edge between woods to lawn?
- Children ages 5-13 playing outdoors are at greater risk for tick bites and Lyme disease.

### TICK LIFE CYCLE



Exposure to tick-borne illnesses can happen any time of the year but **RISK is highest in spring and summer months**



Distance yourself from ticks. Create a 3 ft. or wider wood chip, mulch, or gravel border between woods, stonewall and lawns.

Place children's play area on wood chips or sand.

### Minimize Interactions with Ticks

1. Reduce interactions with ticks by creating a 3 foot or greater buffer from wooded edges.
2. Move children's play area away from wooded areas and place on wood chips or sand to reduce exposure to ticks.
3. Fencing off ornamental plant and vegetable beds can reduce interactions with animals transporting ticks.
4. Rodents transmit illnesses to ticks. Clean and seal stonewalls to discourage rodent activity. Doing so will reduce opportunities for rodents to linger.
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Minimize interaction with deer by fencing off plant and vegetable beds.



AVOID creating conditions that ticks favor.



AVOID stonewalls with small openings that could harbor rodents.

Image No. 518203  
518204  
518205  
518206  
518207

Caption:  
Scott Rizzo, USDA Agriculture Research Service, Bugwood.org  
Gary Hoyer, Indiana University, Bugwood.org  
Rick Powell, Cornell University, Cornell University  
Kathy C. Spafford III, Connecticut Agricultural Experiment Station,  
New Britain, Tick Management & Landscaping



**NORTHEASTERN TICKS**  
**Tick-borne illnesses**

A Guide for Identifying Ticks & Symptoms

Cornell University Cooperative Extension Onondaga County

**Brown Dog Tick**  
 Adult female (not to scale)  
 Adult Female  
 Adult Male  
 Nymph  
 0 1/4 Inches

**American Dog Tick**  
 Adult female (not to scale)  
 Adult Female  
 Adult Male  
 Nymph  
 0 1/4 Inches

**Lone Star Tick**  
 Adult female (not to scale)  
 Adult Female  
 Adult Male  
 Nymph  
 0 1/4 Inches

**Black-legged Tick**  
 Adult female (not to scale)  
 Adult Female  
 Adult Male  
 Nymph  
 0 1/4 Inches

Erythema migrans: Chronic migrating redness that is often associated with the early stages of Lyme Disease.




Centers for Disease Control and Prevention, image 1



Robin Stevenson, Dermatlas: <http://www.dermatlas.org>



Bernard Cohen, Dermatlas: <http://www.dermatlas.org>

Attachment D – Tick ID manual