



## Fact Sheet 6

# What is the relationship between deer and Lyme disease?

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### From the CT DPH website via Jennifer Reed of blastlyme:

Ticks found in Connecticut carry a variety of disease-causing agents including rickettsia, bacteria, and protozoa. People can become infected with more than one disease with one tick bite. When multi-infection transmission occurs, diagnosis and treatment can be difficult. Symptoms and treatment for each condition may vary. Besides Lyme disease, ticks in Connecticut can also transmit the following reportable diseases:

- Babesiosis.
- Human granulocytic anaplasmosis/ehrlichiosis (HGA/HGE).
- Rocky Mountain spotted fever (RMSF).

### From Dr. Ed Faison of Highstead

Deer are typically the principal host for adult ticks in this landscape, but deer do not pass the Lyme bacterium to ticks. Mice, and to a lesser extent other rodents, do that. Still, deer play an important role in the life cycle of ticks.

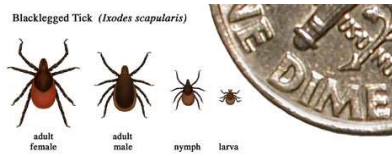
However, reducing the deer population generally has little or minor effect on the tick population unless the deer population is drastically reduced, say below 8 deer per square mile or eliminated altogether. For example, a study on Great Island reduced the deer population by 70% to about 9-11 deer per square mile, and there was no effect on the tick population. But after eliminating deer, the tick numbers dropped. The problem is that it is not at all feasible (or desirable) to reduce the deer population in Ridgefield to numbers that low. You risk extirpating the species altogether, and it would require a sustained effort with sharpshooters that would likely be very unpopular.

Regarding the connection between deer control and Lyme disease, here is a quote from a recent paper (Kugeler et al. 2016):

“the scientific evidence to support the effectiveness of deer control as a means of preventing human Lyme disease is weak. While complete elimination of deer in an ecologically isolated setting with few alternative hosts for adult ticks may substantially reduce the blacklegged tick population, results have been mixed in circumstances where deer are not eliminated. Furthermore, evidence linking deer reduction to reduced human Lyme disease risk is lacking.”

### From Dr. William H. Schlesinger, Cary Institute of Ecosystem Studies

Scientists say that white-footed mice are posing a particularly high risk to humans this year. A bountiful acorn harvest a couple of years ago gave them the sustenance needed to reproduce in greater numbers and climate change may be pushing them to expand their range toward the north. "That's something of a worry because where the mice go, so too go the infected ticks," said Richard Ostfeld, who is co-heading the Cary Institute's Tick Project, along with his wife, Felicia Keesing, a biology professor at Bard College in New York. Ostfeld said there are areas in the United States where Lyme disease is rare and, in those places, few or none of the white-footed mice are infected. But in an endemic area such as one that extends from Virginia to Maine, at least half and sometimes up to 90 percent of the mice are infected with Lyme bacteria. “



**From Cary Institute of Ecosystem Studies**

“Increases in Lyme disease in the northeastern and midwestern United States over the past three decades are frequently uncorrelated with deer abundance and instead coincide with a range-wide decline of a key small-mammal predator, the red fox, likely due to expansion of coyote populations. Further, across four states we find poor spatial correlation between deer abundance and Lyme disease incidence, but coyote abundance and fox rarity effectively predict the spatial distribution of Lyme disease in New York. These results suggest that changes in predator communities may have cascading impacts that facilitate the emergence of zoonotic diseases, the vast majority of which rely on hosts that occupy low trophic levels. ...With white-footed mice and eastern chipmunks being the

most competent reservoirs of these tick-borne diseases.” Ostfeld explains, “It’s not uncommon to see mice with fifty feeding ticks attached. They can carry huge tick burdens without having their fitness compromised. This is bad news for us, because these rodents are also very efficient at harboring and transferring pathogens to feeding ticks.”

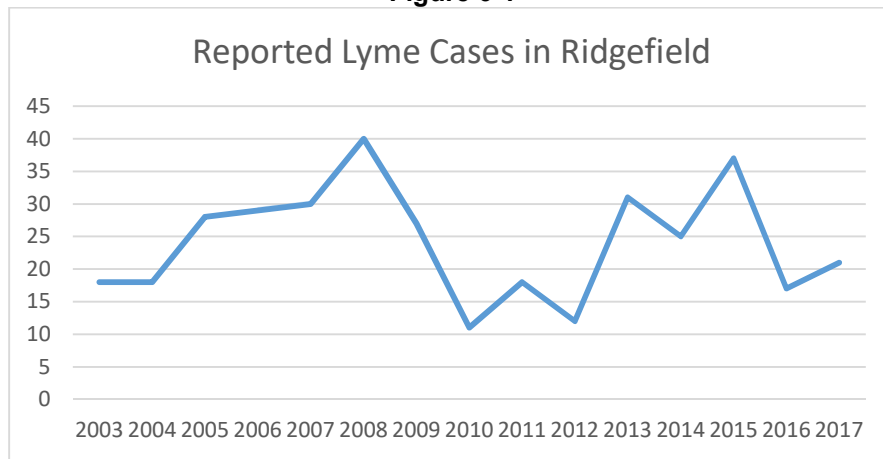
**From the CT DPH website via Jennifer Reid of blastlyme:**

Jennifer Reid has provided Lyme disease numbers from the state; however, the level of under reporting by Lyme-weary physicians in Connecticut makes using these statistics unreliable. Here is the website where the state records them:

<https://portal.ct.gov/DPH/Epidemiology-and-Emerging-Infections/Lyme-Disease-Statistics>

The state data is presented in the Figure 6-1.

**Figure 6-1**



Given the typical level of underreporting, the numbers can be adjusted by a factor of 10 based on Centers for Disease Control methodology.

The hunt in Ridgefield started in 2006. Several years later there was a sharp reduction in Lyme cases. However, from about 2010, Lyme cases have generally been on the increase but still well below the peak in 2008.

**The Bottom Line**

The reduction of deer in Ridgefield, unless brought to very low levels, would not have a significant impact on the incidence of Lyme.