Did You Know That Deer are the primary host of the adult tick and are key to its reproductive success.

To better understand the role that white-tailed deer play in the spread of tick-borne diseases, it is imperative to focus on the life cycle of the blacklegged or deer tick (Ixodes scapularis). The deer tick passes through four life stages (egg, larva, nymph, adult), over a two year period.

Eggs are fertilized in the fall and winter, then deposited in leaf litter the following spring. They emerge as larvae in late summer of that year, seeking their first blood meal. The tiny larva crawls around the forest floor on leaf litter questing for an appropriate host. Their first host is generally a white-footed mouse or other small to medium-sized mammal or bird. Once attached, the larvae embed their mouth parts and feed for a few days. If the host is infected with the spirochete that causes Lyme disease, the tick may be infected during this feeding. The larvae then drop off their host into the leaf litter where they molt into the next stage, the nymph, remaining dormant until the following spring.

During the spring and early summer, the nymphs end their dormancy and begin to seek a host. Nymphs are commonly found on the forest floor in leaf litter and on low vegetation. Their host primarily consists of white-footed mice and other rodents, deer, birds and

unfortunately humans. Most cases of Lyme disease are reported from May through August, which corresponds to the peak activity for nymphs. This suggests that the majority of Lyme disease cases are transmitted by nymphal deer ticks. After feeding for several days the nymph ticks drop off to the forest floor.

Over the next few months the nymph molts into the larger adult deer tick, which emerges in fall, with peak in October through November but are active throughout the winter months when temperatures are above 40 degrees Fahrenhiet. Both male and female adults find and feed on a host, then the females lay eggs sometime after feeding.

Adult ticks wait for host animals from the tips of grasses and shrubs approximately one meter above the ground. When an animal or person brushes by the vegetation, they quickly let go and climb onto the host. Adult ticks feed on their host for five to seven days. Often times, the host encountered is a white-tailed deer. Most ticks are found on the shoulder, neck, face and ears of a deer. The female will become engorged with blood, providing nourishment for her developing eggs. After feeding and mating, the female tick drops into the leaf litter where she lays hundreds to thousands of eggs depending on the condition of the female and the quality of the blood meal. This completes the two year cycle for the deer tick.

The Lone Star tick is another common tick capable of transmitting disease. The earliest significant activity of Lone Star ticks begins when average ambient temperatures are above 50 degrees Fahrenheit. Each female produces 3,000-8,000 eggs, which are deposited under leaf and soil litter in middle to late spring. Incubation may take 30 days or longer, depending on temperature. The newly hatched six-legged larvae or seed ticks feed for several days on a host. After full engorgement the larvae drop from the host into vegetation and shed their skins 9-27 days later.

The eight-legged nymphs attach to a second host and feed for up to 38 days; the nymphs then detach and rest for 13-46 days before they shed their skins to become adults. Adult Lone Star ticks are active throughout the spring, peaking in May and declining until the end of June. During this time, adults seek a third host, feed for 6-24 days before they detach. The nymphal Lone Star ticks have a much longer period of activity and may occur from May through early August, with a peak in activity during May or June.

The Lone Star larvae first appear in late July and peak in early August. Larval Activity may also continue until late September. These larvae result from female ticks that have successfully fed and mated with a male tick earlier that same spring.

Oviposition occurs 7-16 days after the last blood meal. Larvae may survive for 2-9 months, and nymphs and adults for 4-15 months each; the life cycle may take up to 2 years to complete.

Lone Star tick nymphs can walk quickly and may cover a person's legs or arms in less than five minutes. This is a good behavioral characteristic to note to aid in identification of this tick species. Both adults and nymphs are active from early spring through midsummer, while larvae are active mainly from late summer to early fall.

Researchers have found that there is a close relationship between the rising number of Lyme disease cases, as well as other tick-borne diseases, and the proliferation of deer across the United States. Areas with high rates of Lyme disease correspond with areas of the US that are highly populated with deer, especially here in the northeast. Dr. Kirby Stafford, PhD., an expert on ticks with the Connecticut Agriculture Experiment Station, believes that "deer are the key to tick abundance. If we could bring deer ticks low enough we could break the cycle between reservoir hosts and ticks. No ticks, no Lyme disease." The study by Dr. Peter Rand of the Maine Medical Center confirmed that this approach worked on Monhegan Island, Maine. Other studies have shown that it is not necessary to completely eliminate deer; reducing the deer population to 8 per square mile or less is sufficient to prevent most if not all ticks from

reproducing and will dramatically reduce the rate of Lyme disease.

Ref: http://www.cdc.gov/ticks/diseases
CDC: Centers for Disease Control and Prevention
Tickborne Diseases of the U.S.

http://www.cvbd.org/en/tick-borne-diseases
Companion Vector-Borne Diseases

http://www.lymeinfo.com/ticks/life-cycle.html
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http://www.deeralliance.com/node/10
Fairfield County Municipal Deer Management Alliance
2010

http://www.health.ny.gov/publications/2825/
revised July 2011