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Effects of Reduced Deer Density on the Abundance of *Ixodes scapularis* (Acari: Ixodidae) and Lyme Disease Incidence in a Northern New Jersey Endemic Area

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Abstract

We monitored the abundance of *Ixodes scapularis* Say (Acari: Ixodidae) and the Lyme disease incidence rate after the incremental

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removal of white-tailed deer, *Odocoileus virginianus* Zimmermann, within a suburban residential area to determine whether there was a measurable decrease in the abundance of ticks due to deer removal and whether the reduction in ticks resulted in a reduction in the incidence rate within the human population. After three seasons, the estimated deer population was reduced by 46.7%, from the 2002 postfawning estimate of 2,899 deer (45.6 deer per km²) to a 2005 estimate of 1,540 deer (24.3 deer per km²). There was no apparent effect of the deer culling program on numbers of questing *I. scapularis* subadults in the culling areas, and the overall numbers of host-seeking ticks in the culling areas seemed to increase in the second year of the program. The Lyme disease incidence rate generated by both passive and active surveillance systems showed no clear trend among years, and it did not seem to vary with declining deer density. Given the resources required to mount and maintain a community-based program of sufficient magnitude to effectively reduce vector tick density in ecologically open situations where there are few impediments to deer movement, it may be that deer reduction, although serving other community goals, is unlikely to be a primary means of tick control by itself. However, in concert with other tick control interventions, such programs may provide one aspect of a successful community effort to reduce the abundance of vector ticks.

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