

Risk of Lyme Disease in eastern Ontario

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Introduction

Lyme disease is an illness carried by *Ixodes capularis*, commonly known as the black legged tick, figure 1 and figure 2. It is common in North America. Untreated it may cause neurological problems.

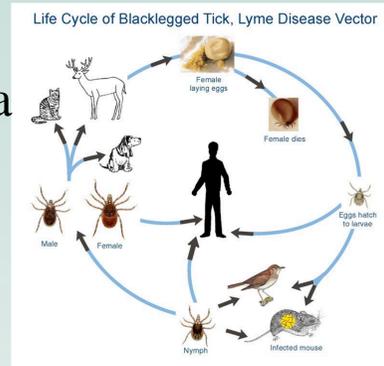


Figure 1. Lifecycle of the tick, showing how it can come into contact with humans

Source: <http://www.lymeontario.org/page.php?id=1797>

In our research we have focused on the White Tail deer as the host of the tick, and chosen the area of Southeastern Ontario to specify our research. We focus on the distribution in winter and summer.

Objective

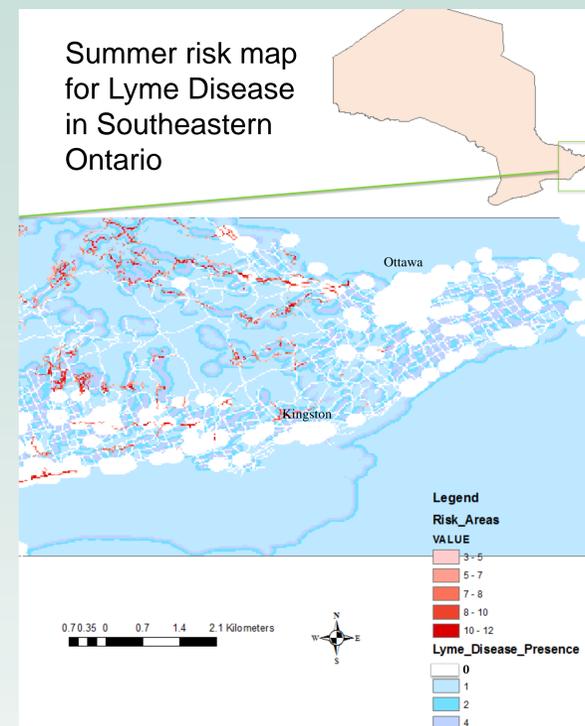
To show the areas at risk to Lyme disease in Southeastern Ontario through a suitability analysis of the area of potential interaction between people and white tailed deer, in the winter and summer.

References
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 GUERRA, M., WALKER, E., JONES, C., PASKIEWITZ, S., CORTINAS, M. R., STANCIL, A., BECK, L., BOBO, M. & KITRON, U. 2002. Predicting the risk of Lyme disease: habitat suitability for *Ixodes scapularis* in the north central United States. *Emerg Infect Dis*, 8, 289-97. LDAO. 2013. *Facts About Lyme Disease* [Online]. Available: <http://www.lymeontario.org/page.php?id=1797> [Accessed 25/11 2013].
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results

These two maps show the results of our analysis, the high values represent areas of risk.

The red values relate to risk specific to humans. The blue values relate to where Lyme disease may be, with little human interaction. The white shows areas of no risk



Winter risk map for Lyme Disease in Southeastern Ontario

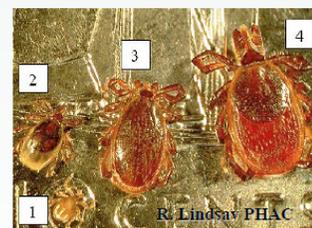
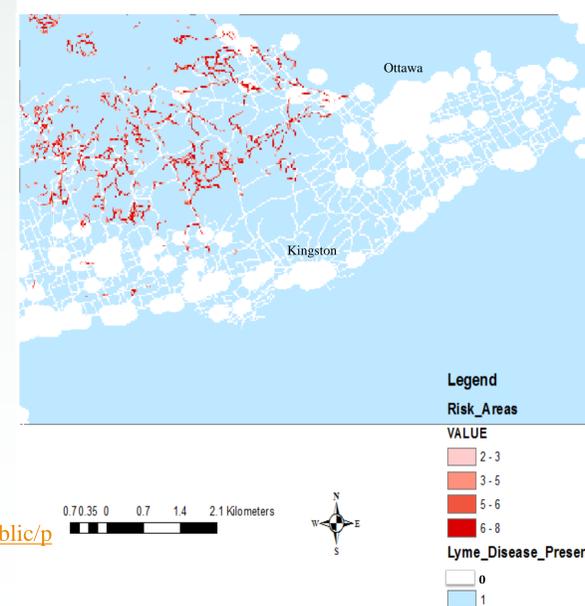


Figure 2. The black legged tick at different stages, 1-2 – nymph, 2-3 – adult

Source: <http://www.health.gov.on.ca/en/public/publications/disease/lyme.aspx>

Data & methods

Table 1. Data type, source and influence

Influenced	Data type	Source (Scholars Geoportal)
People/deer	population	Scholars Portal, Ontario Council of University Libraries
People	Trail	OMNR
People	Major roads	DMTI Spatial Inc.
Deer	Winter deer yards	OMNR
Deer (only or Summer)	Water	OMNR

We did a raster calculation to find the area at specific risk to humans for each season, figure 3, and overlaid this onto the area where the tick could be.

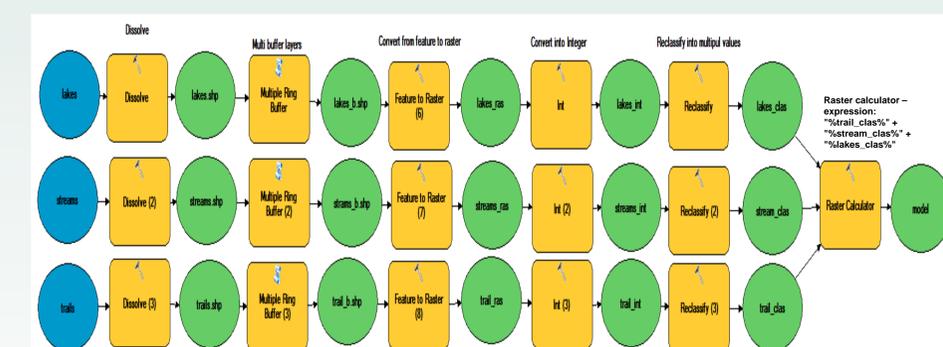


Figure 3. flow chart of methods to determine areas at risk to humans in the summer

Conclusion

We found that the seasons produce differences in the areas of high risk. This is important to recognise and could be important for recreational activities.