

1.2 Changing migration patterns and increased activity of disease vectors (West Nile Virus (WNV) and Lyme Disease)

According to the [World Health Organization](#) (WHO)

“Vectors are living organisms that can transmit infectious diseases between humans or from animals to humans. Many of these vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later inject it into a new host during their subsequent blood meal. Mosquitoes are the best known disease vector. Others include ticks, flies, sandflies, fleas, triatomine bugs and some freshwater aquatic snails.”

As discussed in the Section 1.1, the presence of vectors and the diseases they carry may not be caused by climate change but the change in their migration, breeding and life cycle patterns are definitely influenced. For example, increased annual temperatures may allow for a longer more active season for disease vectors and an increase in precipitation may allow for more standing water and mosquito breeding grounds.

The Halton Region Public Health Department conducts the disease vector surveillance programs for the municipalities of Oakville, Milton, Burlington and Halton Hills. These surveillance programs currently include West Nile virus and Lyme disease, both of which are discussed in detail below.

West Nile Virus (WNV)

Increased annual precipitation in combination with rising temperatures has the potential to increase WNV activity in Southern Ontario. Mosquitoes that carry WNV, the adult *Culex pipiens* mosquito (the common house mosquito), lay their eggs on the surface of warm standing water, of which it projected that there will be more.

On the brighter side of climate change, depending on the degree of increase in annual temperatures increased evaporation could occur in turn decreasing standing water sites that are breeding grounds for mosquitoes that carry WNV.

Halton Region, in partnership with area municipalities, leads the [WNV surveillance program](#) tracking all WNV activity in the region. Mosquito larvicide is applied to stormwater ponds and catch basins, which tend to hold standing water throughout the WNV season. Residential concerns are forwarded to the municipal partners for action.

Building your resiliency

To protect yourself [Halton Region suggests](#) to:

- [Remove all standing water sites on your property](#); this includes bird baths, children's toys, unopened pools, eavestroughs, drains, wading pools and wheel barrows. Mosquitoes only need one inch of water to lay their eggs.
- Remove swampy or brush areas on your property where mosquitoes may be living.
- [Report standing water](#) on public and private property. Dial 311 and you will be directed to the appropriate department.
- Wear light coloured clothing, long pants and sleeves, and remember to apply insect repellent.
- Avoid being out in early mornings and early evenings as this is when mosquitoes are most active.
- Refer to [Halton Region's WNV webpage](#) for historical and up-to-date information on the number and location of treated sites, positive mosquito pools and probable human cases.

Building the town's resiliency

- Refer to the themes: Natural Environment and Biodiversity and Health and Wellness in the town's Climate Change Strategy.

Black-Legged Ticks and Lyme Disease

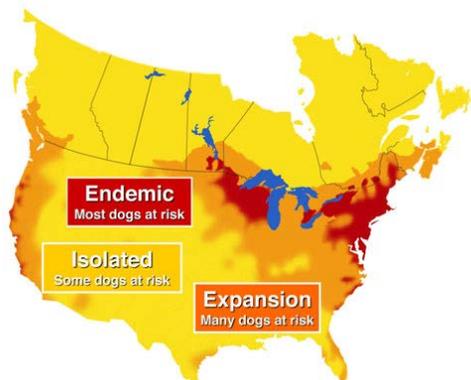
The migration of the blacklegged tick, formerly known as the deer tick, is being closely monitored by climate change and public health scientists since warmer temperatures will allow blacklegged ticks that carry Lyme disease to migrate north and allow a longer active season.

Blacklegged ticks are present in several parks across the province and the Ministry admits, "it is possible for people to encounter blacklegged ticks, or to be infected with Lyme disease from the bite of an infected blacklegged tick, almost anywhere in the province." Although in slight contrast to that the Ontario's Ministry of Health states that, "blacklegged ticks that are infected with Lyme disease are more common in the United States along the Atlantic seaboard (from Maine to Virginia), and in the Midwest (Minnesota and Wisconsin), than they are in Ontario."



Fig. 1. Distribution of *I. scapularis* tested for *B. burgdorferi* collected from Ontario hosts with no out-of-province travel and the northern detected range, 1993–2002.

Ticks often affix themselves to dogs since dogs wander off manicured paths and into brush areas where ticks often are as well as dog being height appropriate with fur that attracts and hid the tick. According to the [Canine Lyme Disease Centre](#), lyme disease has been found in all 10 Canadian provinces and the presence of lyme disease carrying ticks can be found in the areas highlighted on the map below.



Blacklegged ticks are known to transmit Lyme disease through their bites. Not all blacklegged ticks carry Lyme disease and a tick must remain on its host for 36 - 48 hr in order to transmit the disease.



Figure (e): Blacklegged ticks have three distinct stages in their lifecycle: adult, nymph and larva. Although there are differences between blacklegged ticks and other ticks common throughout Ontario, it is difficult to distinguish these differences and if possible the tick should be shown to a doctor. **Figure (f):** Depicts the typical bull's-eye rash of someone infected with Lyme disease. Not all people who contract Lyme disease will develop the rash, and if you experience any other symptoms of Lyme disease including headache, fever, muscle and joint pains, or fatigue then you should contact a doctor for testing.

Building your resiliency

- Prior to camping or visiting provincial parks refer to the [Ontario Ministry of Health's website](#) to view the locations of blacklegged ticks in the province.

To repel ticks the Halton Regional Health department suggests:

- Wear light-coloured, long-sleeved shirts and pants. The light colours will help you see whether there are any ticks on your clothing.
- Spray clothing and exposed skin with an insect repellent that contains DEET. Read and follow the manufacturer's directions for safe use.
- Tuck your shirt into your pants and your pant legs into your socks to help keep ticks away from your bare skin.
- Wear shoes that cover your entire foot (avoid sandals or open shoes).
- After finishing your outdoor activity, check your clothing and your entire body for any ticks, especially the groin, armpits, and hairline. Check your pets regularly for ticks.

For more detailed information visit [Halton Region's Public Health Department's webpage](#).

Building the town's resiliency

- Refer to the Health and Wellness and Built Environment in the town's Climate Change Strategy.