Tick Borne Diseases Response Plan

April 2017
TICK BORNE DISEASE RESPONSE PLAN

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1.0 INTRODUCTION

The Nova Scotia (NS) Tick Borne Diseases Response Plan was developed by the Nova Scotia Vector Borne Diseases Working Group (NS VBDWG), an interagency, interdisciplinary group, chaired by Nova Scotia Department of Health and Wellness (DHW). The NSVBDWG was established in 2010 but originated from the Tick Borne Diseases working group which was initiated in 2002. The group, consisting of experts in ticks and human health related to vector borne diseases, works together to ensure a consistent and coordinated approach to protecting Nova Scotians from vector borne diseases, including those transmitted by ticks. This group of experts is responsible for developing and implementing this Tick Borne Diseases Response Plan and for the ongoing assessment of risk to Nova Scotians. Members of the working group meet regularly to monitor all activities related to the response plan.

The key components of the plan include:

- Surveillance for human tick borne illnesses
- Surveillance of distribution and infectivity of vectors for tick borne diseases
- Prevention and control of human infection of tick borne diseases
- Communication to public, media and health care professionals

The development of the plan was in response to Lyme disease, an emerging illness in the province, and its vector, Ixodes scapularis (blacklegged ticks). Blacklegged ticks have established populations in a growing number of areas throughout the province. Based on available evidence and climate factors, it is anticipated that over time, blacklegged tick populations may be established throughout the entire province.

The plan incorporates other diseases that can be transmitted to humans by the blacklegged tick, such as Human Granulocytic Anaplasmosis (HGA) caused by infection with Anaplasma phagocytophilum, Human Babesiosis, caused by infection with Babesia microti, and it also includes information on the bacterium Borrelia miyamotoi and Powassan virus.

1.1 Background

Ixodes scapularis (blacklegged ticks) are the primary source for tick borne diseases in NS, including Lyme disease, Human Granulocytic Anaplasmosis and Babesiosis. Blacklegged ticks were first identified in NS in 2002 and the first human cases of Lyme disease were confirmed in that year.

Migrating birds can carry blacklegged ticks into areas of NS. Blacklegged ticks may not become established in areas where they have been dropped off by birds as the appropriate climate and habitat are not always present. Adult blacklegged ticks normally feed on deer while nymphs primarily feed on small rodents such as mice and squirrels. Movement and establishment of blacklegged tick populations in Canada are related to climate change.

Blacklegged tick populations have become established in some areas in NS. Although there are areas of NS where the risk of encountering blacklegged ticks is higher, there is a possibility of
encountering blacklegged ticks anywhere in the province. Humans may become infected with the bacteria that causes Lyme disease through the bite of an infected nymphal or adult blacklegged tick. People are most likely to be exposed to blacklegged ticks in long grass or shrubs in regions with established populations of infected ticks.

Other ticks in NS, such as the common dog tick, do not transmit Lyme disease, Babesiosis or Anaplasmosis. Anaplasma, Babesia and *Borrelia miyamotoi* have been detected in a small number of blacklegged ticks or small mammals in the province. Powassan virus disease has not been found specifically in Nova Scotia, yet there has been evidence of the virus in the Maritimes.

### 1.2 Goals And Objectives Of Plan

Goal:
To monitor and reduce the risk of infection with tick borne diseases in Nova Scotia.

Objectives:
- To assess the presence and spread of blacklegged ticks and tick borne diseases in NS.
- To assess the risk of human infection from tick borne diseases in NS.
- To assess the incidence of human infection with tick borne diseases in NS.
- To increase the awareness of the public and health care professionals (HCPs) about the risk of infection with tick borne diseases.
- To increase public and HCPs awareness about typical symptoms and signs of tick borne diseases.
- To provide information to the public and HCPs about effective ways to prevent exposure to and infection with tick borne diseases.
- To identify and implement evidence based strategies to control the spread of vectors of tick borne diseases, as appropriate.

### 2.0 ROLES AND RESPONSIBILITIES OF ORGANIZATIONS AND AGENCIES RELATED TO TICK BORNE DISEASES

#### 2.1 Nova Scotia Department of Health and Wellness (DHW)

- Conducts surveillance for human infection with Lyme disease and for any rare or unusual diseases.
- Summarizes, interprets and produces reports from human case surveillance information, including the Vector borne and other Zoonoses section of the Annual Notifiable Disease Surveillance Report and other ad hoc reports ([novascotia.ca/dhw/populationhealth/](http://novascotia.ca/dhw/populationhealth/)).
- Develops guidance documents for public health surveillance and case management of humans with tick borne diseases in consultation with other NS government departments, the NS VBDWG, the Public Health Agency of Canada (PHAC), and the Infectious Diseases Expert Group (IDEG).
• Monitors the effect of tick borne diseases on the health of Nova Scotians.
• Provides communication support for provincial prevention initiatives, media coverage, news releases, and other materials as required.
• Coordinates and chairs the NS VBDWG.
• Coordinates and chairs the Lyme and Tick Surveillance Technical Working Group (a sub group of the Vector Borne Diseases working group). This group reviews and analyzes blacklegged tick surveillance data and human case surveillance data and prioritizes surveillance initiatives.
• Communicates information on changes in area’s level of risk to the Medical Officer of Health of the area, the Chief Medical Officer of Health, and the chair of the NS VBDWG (who will coordinate communication efforts at the provincial level).

2.2 Nova Scotia Department of Natural Resources (DNR)

• Conducts active tick surveillance in collaboration with DHW and PHAC as required.
• Forwards blacklegged ticks and/or small mammals to NML in Winnipeg for testing as required.
• Contributes to the review and analysis of blacklegged tick surveillance data to prioritize surveillance initiatives, through the Lyme and Tick Surveillance Technical Working Group.

2.3 Public Health Agency of Canada/National Microbiology Laboratory (PHAC/NML)

• Conducts active tick surveillance in collaboration with DHW and DNR as required.
• Tests blacklegged ticks and small mammals for *B. burgdorferi*, *B. miyamotoi*, Babesia, and *Anaplasma phagocytophilum*.
• Contributes to the review and analysis of blacklegged tick surveillance data in order to prioritize surveillance initiatives, through the Lyme and Tick Surveillance Technical Working Group.
• Provides Lyme disease confirmatory laboratory testing of EIA positive or indeterminate samples sent from the QEII anchor laboratory of the Provincial Public Health Laboratory Network.
• Provides Anaplasma testing on human samples.
• Sends human lab reports to the QEII anchor laboratory of the Provincial Public Health Laboratory Network.
• Provides direction on standards for laboratory testing of suspect Lyme disease and other tick borne diseases.

2.4 Public Health in the Nova Scotia Health Authority (NSHA)

• Investigates all reported probable and confirmed cases of Lyme disease and Anaplasmosis (as per case definitions), and submits reports to DHW.
• Determines location where acquisition most likely occurred.
• Educates about tick borne diseases and measures to prevent disease.
• Provides advice to the public and health care professionals regarding tick borne diseases.
• Establishes links with local communities where established blacklegged tick populations occur and works with communities to promote awareness to decrease the risk of tick borne diseases.
• Provides communication support for local public health about Lyme disease and other tick borne diseases prevention initiatives, media, news releases, issue management, print materials and others as required.

2.5 Nova Scotia Department of Agriculture (NSDA)

• Provides link to veterinarian community.
• Provides educational information to veterinarians.

2.6 First Nations and Inuit Health (FNIH)

• Provides link to First Nations communities.
• Provides educational materials to First Nations communities.

2.7 Provincial Public Health Laboratory Network (PPHLN)

• Provides expertise in human infectious diseases and links to the infectious diseases specialist group.
• Provides timely and appropriate human diagnostic laboratory services for Lyme disease and other tick borne diseases.
• Works in collaboration with NML for human diagnostic testing and reports results from the NML to Public Health.
• Reports all confirmed positive tests to the appropriate MOH.
• Responds to questions from physicians, other health care providers and public health staff on laboratory issues.

2.8 Nova Scotia Environment

• Provides recommendations and advice on the use of tick control measures.
• Assesses environmental health issues related to tick control methods.

3.0 DIAGNOSTIC TESTING AND CASE MANAGEMENT

3.1 Lyme Disease

Diagnostic Testing for Human Illness

Serologic testing for Lyme disease follow the 2-tier approach recommended by the NML, the Canadian Public Health Laboratory Network (CPHLN) and the U.S. Centers for Disease Control involving an approved screening enzyme immunoassay (EIA) and more specific confirmatory testing by Western Blot. Testing for Lyme disease in humans in Nova Scotia is performed at the Queen Elizabeth Health Sciences Centre (QEII) in Halifax using an EIA method. Positive
or indeterminate specimens are forwarded to the NML for further supplemental testing using IgM and IgG immunobLOTS. The performance of the testing depends on the stage of infection. Although the sensitivity of testing in late Lyme disease is high, the sensitivity of the 2-tier algorithm is low in early localized Lyme disease and not recommended. Patients who present with early localized Lyme disease should be treated without serologic testing. Other unapproved tests may be unreliable and are not recommended. Specimens submitted for Anaplasmosis diagnostic testing are sent directly to the NML.

For further information on testing please refer to the Provincial Public Health Lab Network: User’s Manual. cdha.nshealth.ca/pathology-laboratory-medicine

Case Management

Human cases of specific vector borne diseases are reportable by health care providers to Public Health under the Regulations of the Nova Scotia Health Protection Act. In addition, health professionals are provided with information on clinical assessment for Lyme disease (and other tick borne diseases as needed).

Guidelines for Public Health case management of Lyme disease, including clinical information, can be found here: novascotia.ca/dhw/cdpc/cdc/

The Infectious Diseases Expert Group (an independent advisory committee that provides expert advice to DHW on the prevention and control of infectious/communicable diseases) has developed a ‘Statement for Managing Lyme Disease in Nova Scotia’ novascotia.ca/dhw/CDPC/documents/statement_for_managing_LD.pdf Please refer to this document for further information regarding diagnostic testing and clinical management of Lyme disease.

3.2 Other Tick Borne Diseases

Clinical information related to HGA, Babesiosis, Borrelia miyamotoi, and Powassan can be found here: https://www.cdc.gov/DiseasesConditions/az/b.html

4.0 EPIDEMIOLOGY AND SURVEILLANCE

4.1 Epidemiology

Human cases of Lyme disease are reportable, under the Regulations of the Nova Scotia Health Protection Act, to the Nova Scotia Department of Health and Wellness. Other tick borne diseases such as Anaplasmosis and Babesiosis are reportable in NS as “any unusual disease occurrence” under the Health Protection Act (It’s the Law: Reporting Notifiable Diseases and Conditions). There have been no human cases of Anaplasmosis to date. One horse was confirmed with Anaplasmosis in 2009. No human cases of Babesiosis or Powassan virus have been reported in NS.

From 2002 to 2015, there was a total of 701 cases of Lyme disease reported in Nova Scotia. In 2015, there were 254 reported cases of Lyme disease, which was an increase from the 115 cases reported in 2014. The Annual Notifiable Disease Surveillance Report contains more
information, such as disease trends and highlights, and can be found here: novascotia.ca/dhw/populationhealth/

The increase in Lyme disease cases is due to a number of factors including:
• an increase in the number of blacklegged tick populations established in NS,
• increases in the sizes of the established populations of blacklegged ticks,
• increases in the rate of infection with _B. burgdorferi_ within the tick populations,
• an increase in awareness among individuals and health care providers leading to increased diagnosis and reporting of Lyme disease.

4.2 Surveillance

National case definitions are used for surveillance of human Lyme disease in NS. The Public Health surveillance case definitions and case report forms are found in the Surveillance Guidelines for Notifiable Diseases and Conditions novascotia.ca/dhw/populationhealth/surveillanceguidelines/. Health care workers are required to notify Public Health of all human cases of Lyme disease. Public Health will determine if the case meets the case definition and will then initiate investigation of the case. Health care workers and laboratories are also required to report any rare or unusual diseases to Public Health, such as HGA, Babesiosis or Powassan disease.

DHW reviews the geography of human cases and passive tick submissions (e.g. National Microbiology Laboratory, Museum of Natural History) to determine if any further active tick surveillance is required.

Based on historical human and tick data to date, DHW has made the decision to declare the entire province of NS a risk area and active tick surveillance in 2017-2018 will not be conducted. The need for further active surveillance will be reviewed in early 2018.

5.0 RISK AND PREVENTION

5.1 Risk assessment

While blacklegged ticks infected with _B. burgdorferi_ have been found sporadically in several areas of Nova Scotia and the province is considered an “at risk area”, the risk for human infection is greatest in areas where infected blacklegged ticks have become established and exposure to the ticks is more likely.

DHW shares information about the distribution and presence of blacklegged ticks, Lyme disease and other tick borne diseases with the public, media and health care professionals on a regular basis. The information is used to provide guidance about the risk of infection from Lyme disease and other tick borne diseases in NS.
5.2 Risk reduction

To reduce the risk of tick borne diseases in NS, several steps are used:

- Continually reassess the effectiveness of a surveillance system for vectors (blacklegged ticks) and maintain surveillance for human illness to detect the level of activity in NS, in order to communicate risk to the public and health care professionals.

- Reduce blacklegged tick habitat around homes by recommending landscaping techniques. There are various landscaping techniques that are recommended to reduce the number of ticks around homes. Currently there are three approved acaracides available in Canada to reduce blacklegged ticks. Two products are domestic class products (Safer’s Trounce Hoseend Lawn & Turf Insecticide) and one is a commercial class product (Deltaguard SC Insecticide, Reg. # 28791). The domestic class products are available to the general public whereas the commercial class product is only available to provincially certified applicators. Resources for landscaping techniques are located at: novascotia.ca/dhw/CDPC/lyme.asp

- Educate health care professionals and veterinarians to recognize symptoms of tick borne diseases.

- Educate the public on measures to reduce exposure to blacklegged ticks.

5.3 Public Awareness and Education

Actions taken by the general public play an important role in preventing human cases of Lyme disease, HGA and other tick borne diseases. The public is provided information on Lyme disease and other tick borne diseases including risks, symptoms and how to prevent the spread of tick borne diseases. The DHW website is continually updated to include information on Lyme disease. The public can receive further information from Public Health in the NSHA.

Press releases and media interviews keep the public informed and updated during the spring, summer and fall months as needed.

Key messages include:

- Cover skin when walking, working, or playing in areas where ticks may be found.
- Wear closed shoes, tuck shirt in pants and pant legs in socks.
- Walk on well-traveled paths, avoiding high grass and vegetation.
- Use an insect repellent (DEET or Icaridin) following label directions carefully.
- Check yourself, children and pets after walking in grassy or wooded areas. Check clothing and inspect skin including in and around ears, arm pits, inside belly button, groin, around the waist, and especially in hair and scalp area. When possible, take a bath or shower within two hours of coming indoors. This makes it easier to find ticks and washes away loose ones.
- Remove ticks as soon as they are found. Carefully grasp ticks with tweezers as close to the skin as possible and pull the tick straight out. Clean and disinfect the area where the tick was attached to the skin.
- See a health care professional if symptoms of Lyme disease or other tick borne disease develops after exposure to a blacklegged tick or to an area where blacklegged ticks are known to be established.

- Use simple landscaping techniques to reduce the number of blacklegged ticks around homes and parks: novascotia.ca/dhw/CDPC/lyme.asp.
6.0 COMMUNICATION STRATEGY

To raise awareness of Lyme disease and other tick borne diseases within Nova Scotia, the DHW will partner with the NSHA and other government and community partners to:

• **Provide Nova Scotians with consistent, up to date and reliable information about tick borne diseases, including Lyme:**

The department will continue to educate Nova Scotians about ticks and the risk of Lyme disease through an annual public announcement. The announcement will be supported by a social media campaign throughout tick season with information, fact sheets and brochures available online. The department will work with its partners to identify and explore alternative methods of sharing information with the public.

• **Emphasize the importance of individual responsibility in preventing the transmission of tick borne diseases:**

The department will work with the Nova Scotia Health Authority and other government and community partners with a focus on creating greater awareness for Nova Scotians to self-manage the prevention of getting Lyme disease. This includes, but is not limited to, engaging community organizations, providing information online and through healthcare professionals, so that Nova Scotians have the right information and tools they need should they encounter a tick.

• **Ensure healthcare providers, health system and the public have access to information about Lyme disease:**

Nova Scotians expect their healthcare providers to be knowledgeable when it comes to the identification, management and treatment of Lyme disease. The department will continue to engage healthcare professionals to ensure they have the most up to date information to address patient questions and concerns, and provide an appropriate level of care.

• **Dispel misinformation about Lyme disease and other tick borne diseases.**

Supported by its partners, the department will address misinformation, as it’s identified, related to Lyme disease to ensure Nova Scotians have access to reliable and consistent information.

7.0 RESOURCES


Centers for Disease Control and Prevention: [cdc.gov/lyme/postLDS/index.html](http://cdc.gov/lyme/postLDS/index.html)

Prepared by:
Nova Scotia Vector Borne Diseases Working Group

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