

# 2018–2022 Tick Pathogen Surveillance Report

July 2024

In 2018, a systematic tick surveillance program was initiated by the Vermont Department of Health (VDH) in partnership with the Vermont Agency of Agriculture, Food & Markets (VAAFM) to track blacklegged ticks, *Ixodes scapularis*, and the pathogens they carry. The blacklegged tick is responsible for spreading over 99% of all tickborne disease cases reported in Vermont.

Ticks are collected annually in locations around the state, then identified by species, life stage (nymph, adult), and sex (male, female). Blacklegged ticks are then tested for tickborne pathogens that cause human illness in Vermont: *Borrelia burgdorferi* ([Lyme disease](#)), *Anaplasma phagocytophilum* ([anaplasmosis](#)), *Babesia microti* ([babesiosis](#)), and *Borrelia miyamotoi* ([hard tick relapsing fever](#)). County-level tick infection prevalence and density estimates were calculated based on sampling sites within those counties.

Most humans are infected by bites from immature ticks called nymphs because they are tiny (<2 mm) and difficult to see; they feed during the spring and summer months. Adult ticks are much larger and are more likely to be discovered and removed before they have time to transmit pathogens to humans; they are most active during the fall.

## KEY POINTS

- 10,790 blacklegged ticks were collected during 2018–2022.
- 94% of the ticks collected were blacklegged ticks.
- Over half of all blacklegged ticks tested were infected with at least one pathogen; *Borrelia burgdorferi* (Lyme disease) was the most common.
- Infection prevalence and density of infected ticks were highest in southwestern Vermont.

During 2018–2022, a total of 7,457 blacklegged ticks were tested for four pathogens that cause human illness; infection prevalence for *Borrelia burgdorferi* was the highest.

	Year	Adults	Nymphs	All Life Stages
	2018	1,721	173	1,894
	2019	1,449	545	1,994
	2020	1,548	49	1,597
	2021	1,530	148	1,678
	2022	136*	158	294
	<b>All years</b>	<b>6,384</b>	<b>1,073</b>	<b>7,457</b>
<i>Borrelia burgdorferi</i> (%)		56.7	24.0	52.0
<i>Anaplasma phagocytophilum</i> (%)		8.7	5.2	8.2
<i>Babesia microti</i> (%)		5.5	3.7	5.2
<i>Borrelia miyamotoi</i> (%)		1.2	0.6	1.1

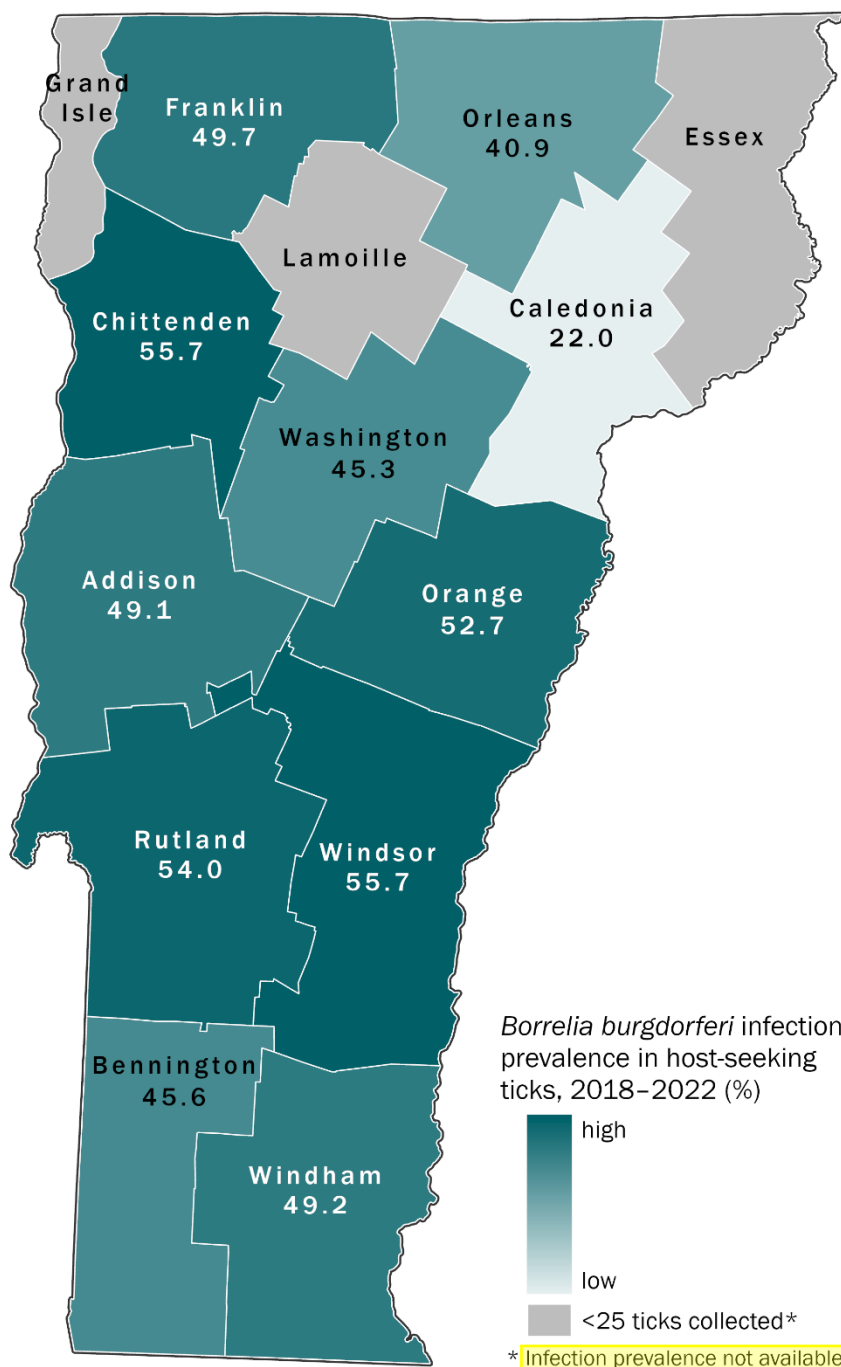
\* Collection of ticks during the fall was discontinued in 2022, which reduced the number of adults collected.

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## *Borrelia burgdorferi* (Lyme disease)

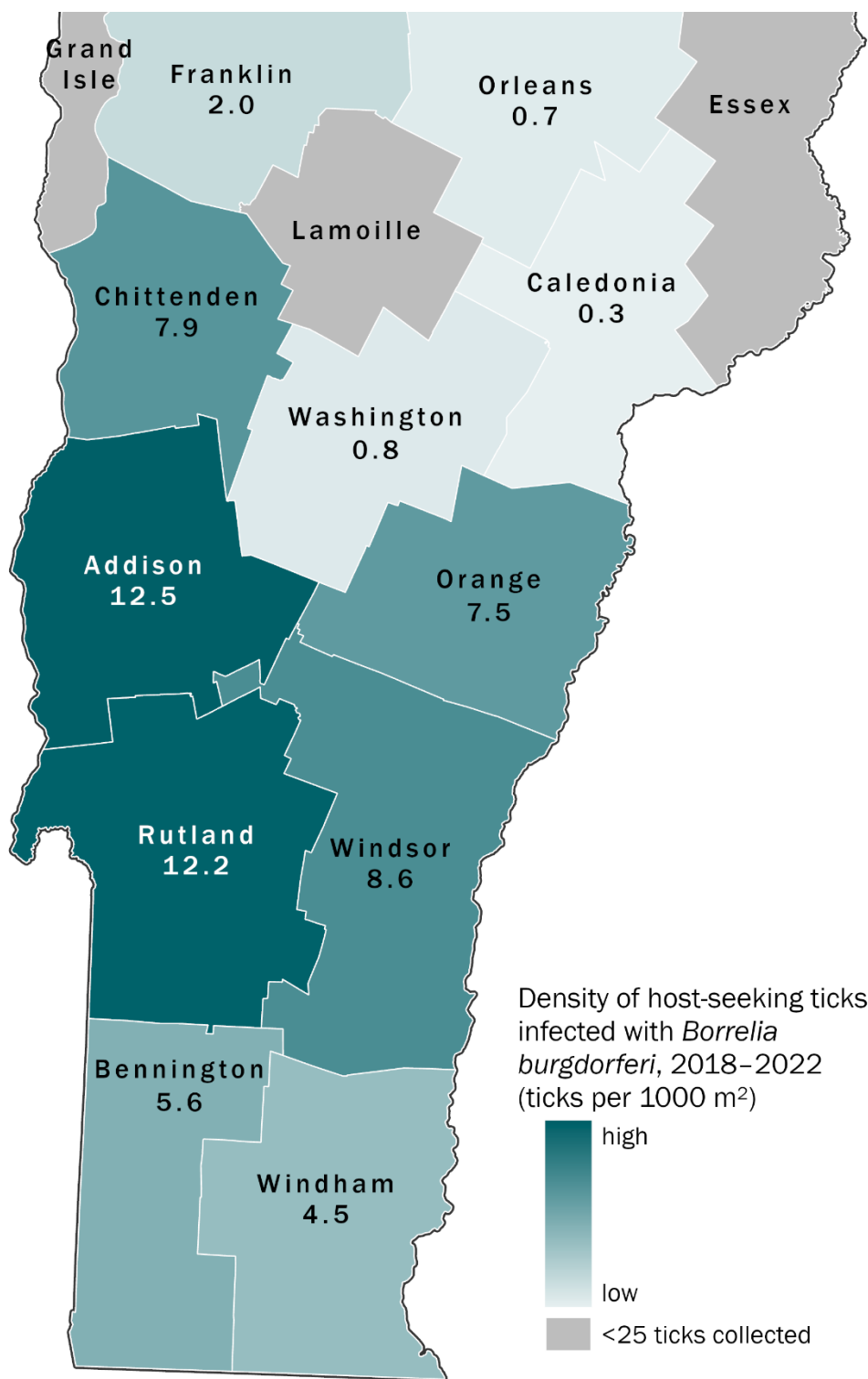
Lyme disease is the most commonly reported tickborne disease in Vermont. It is caused by the bacterium, *Borrelia burgdorferi*. Most human cases are reported in June, July, and August following peak blacklegged tick nymph activity.

**During 2018–2022, Chittenden, Windsor, and Rutland counties had the highest *Borrelia burgdorferi* infection prevalences among host-seeking (adult females and nymphs) blacklegged ticks.**



## 2018–2022 Tick Pathogen Surveillance Report

**During 2018–2022, Addison and Rutland Counties had the highest densities\* of host-seeking (adult females and nymphs) blacklegged ticks infected with *Borrelia burgdorferi*.**



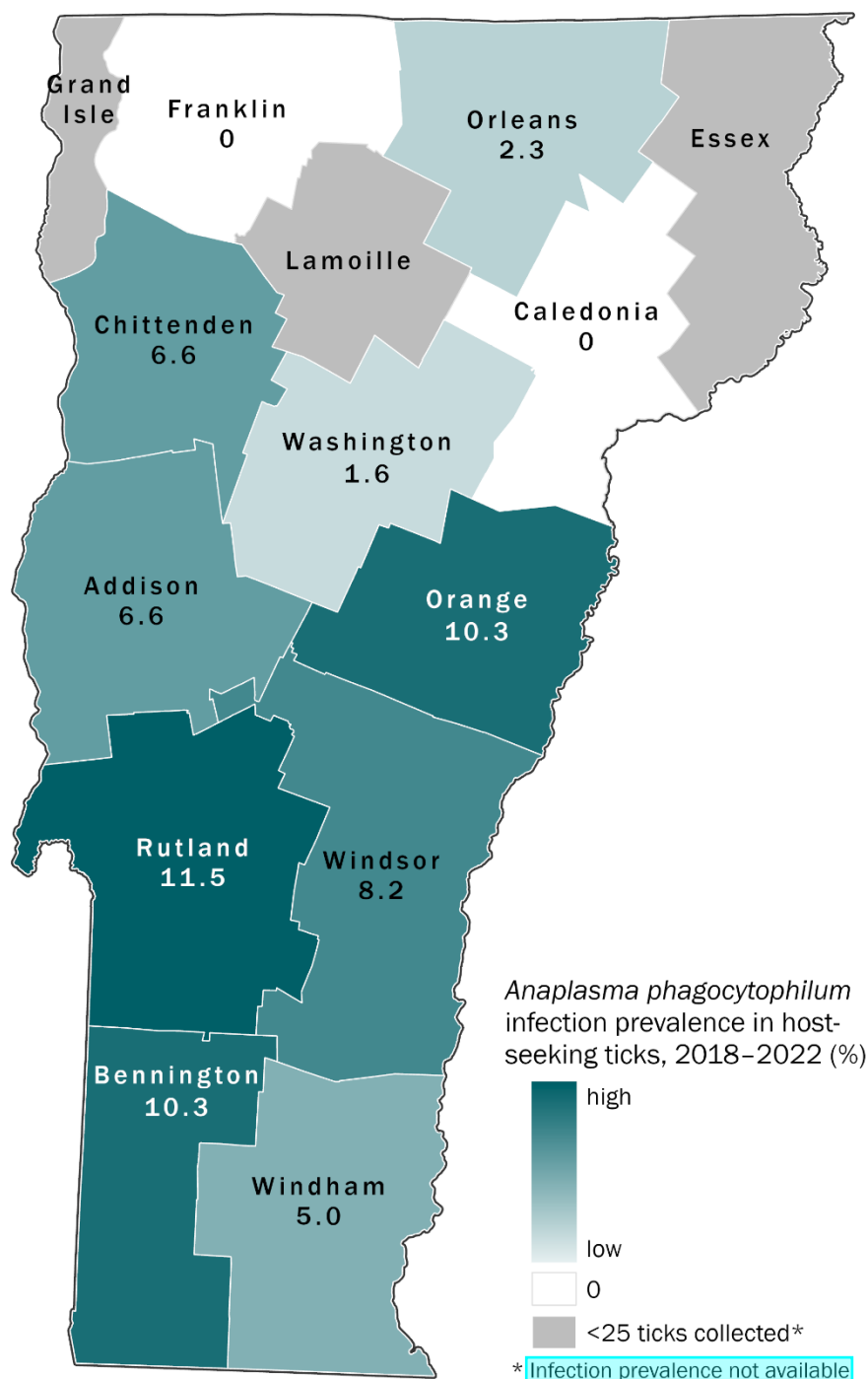
\*Density of infected host-seeking ticks was calculated by multiplying county-level pathogen prevalence by the density of collected host-seeking (adult female and nymphal ticks) per 1000m<sup>2</sup>.

# 2018–2022 Tick Pathogen Surveillance Report

## *Anaplasma phagocytophilum* (anaplasmosis)

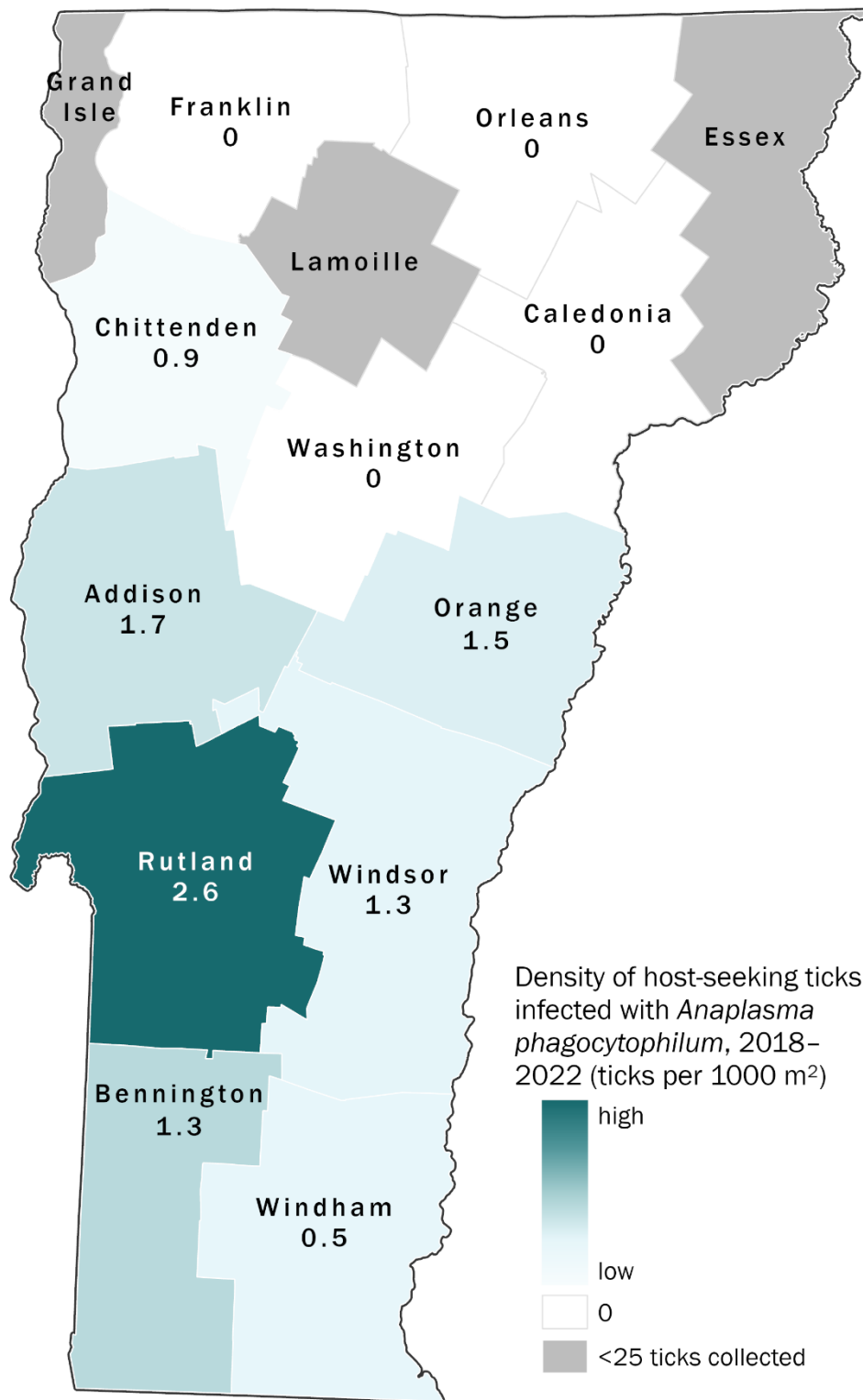
Anaplasmosis is the second most reported and fastest emerging tickborne disease in Vermont. It is caused by the bacterium, *Anaplasma phagocytophilum*.

**During 2018–2022, Rutland, Bennington, and Orange Counties had the highest *Anaplasma phagocytophilum* infection prevalences among host-seeking (adult females and nymphs). blacklegged ticks.**



## 2018–2022 Tick Pathogen Surveillance Report

During 2018–2022, Rutland County had the highest density of host-seeking (adult females and nymphs) blacklegged ticks infected with *Anaplasma phagocytophilum*.

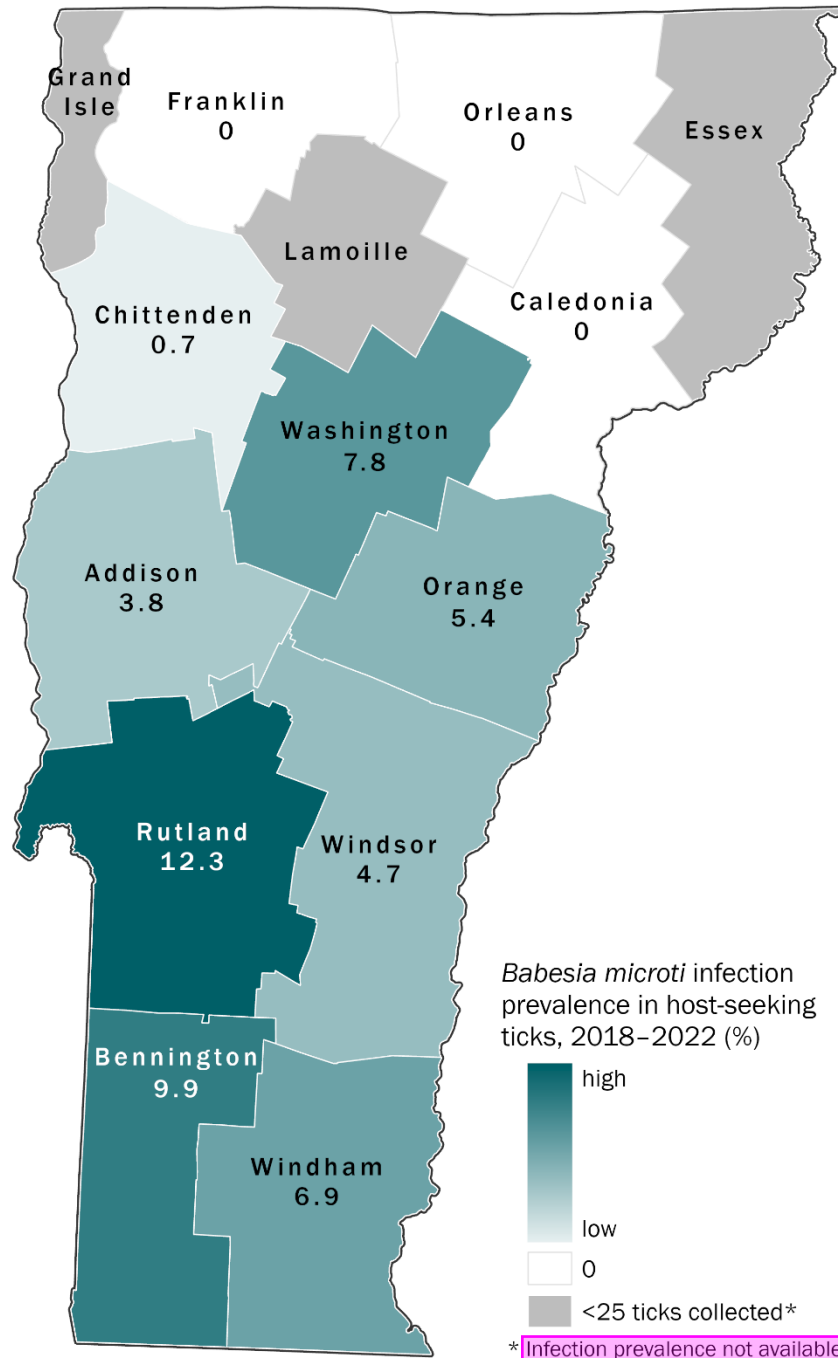


# 2018–2022 Tick Pathogen Surveillance Report

## *Babesia microti* (babesiosis)

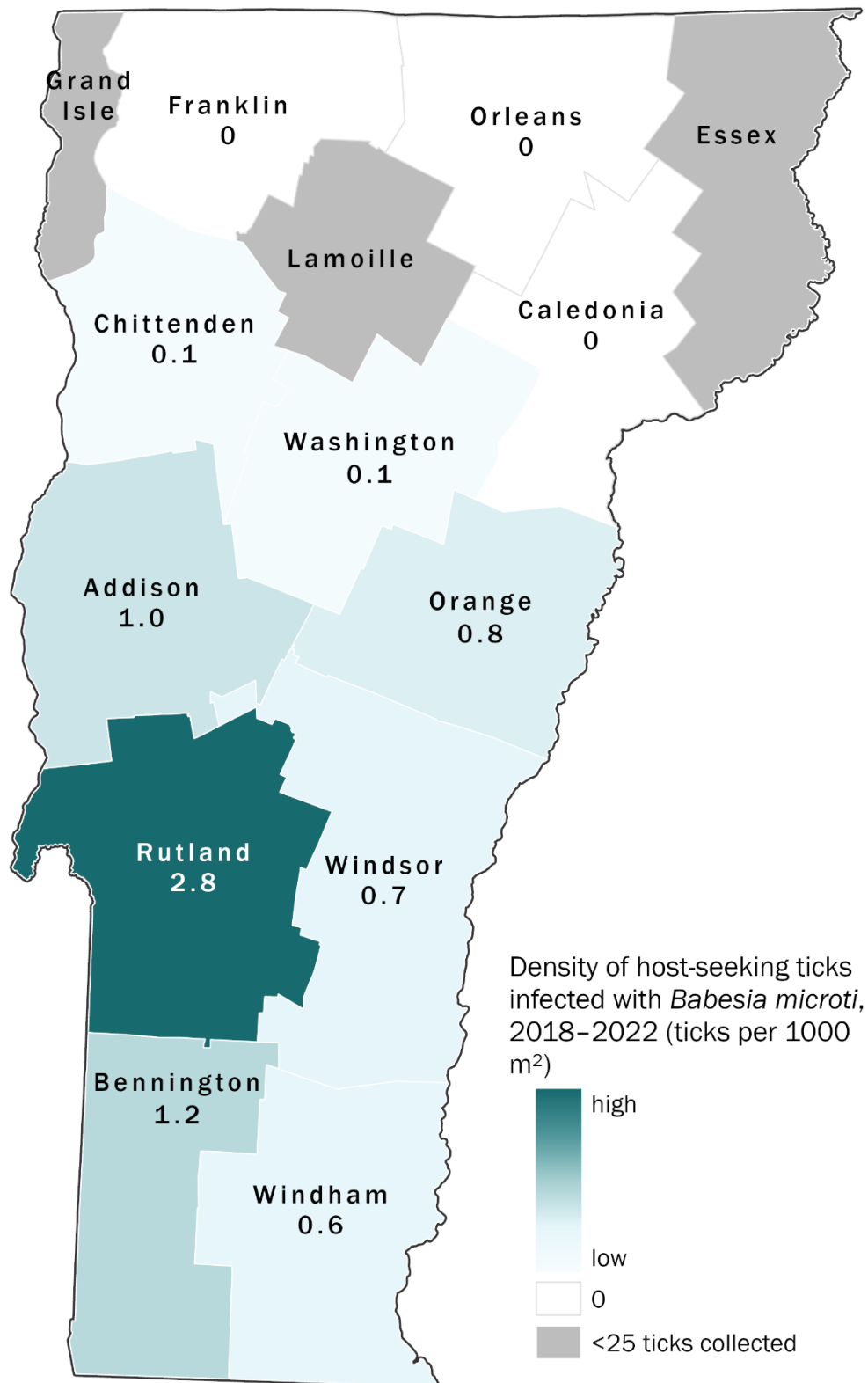
Babesiosis is the third most reported tickborne disease in Vermont. In the Northeast, it is caused by a microscopic blood parasite called *Babesia microti*.

**During 2018–2022, Rutland and Bennington Counties had the highest *Babesia microti* infection prevalences among host-seeking (adult females and nymphs) blacklegged ticks.**



## 2018–2022 Tick Pathogen Surveillance Report

During 2018–2022, Rutland County had the highest density of host-seeking (adult females and nymphs) blacklegged ticks infected with *Babesia microti*.

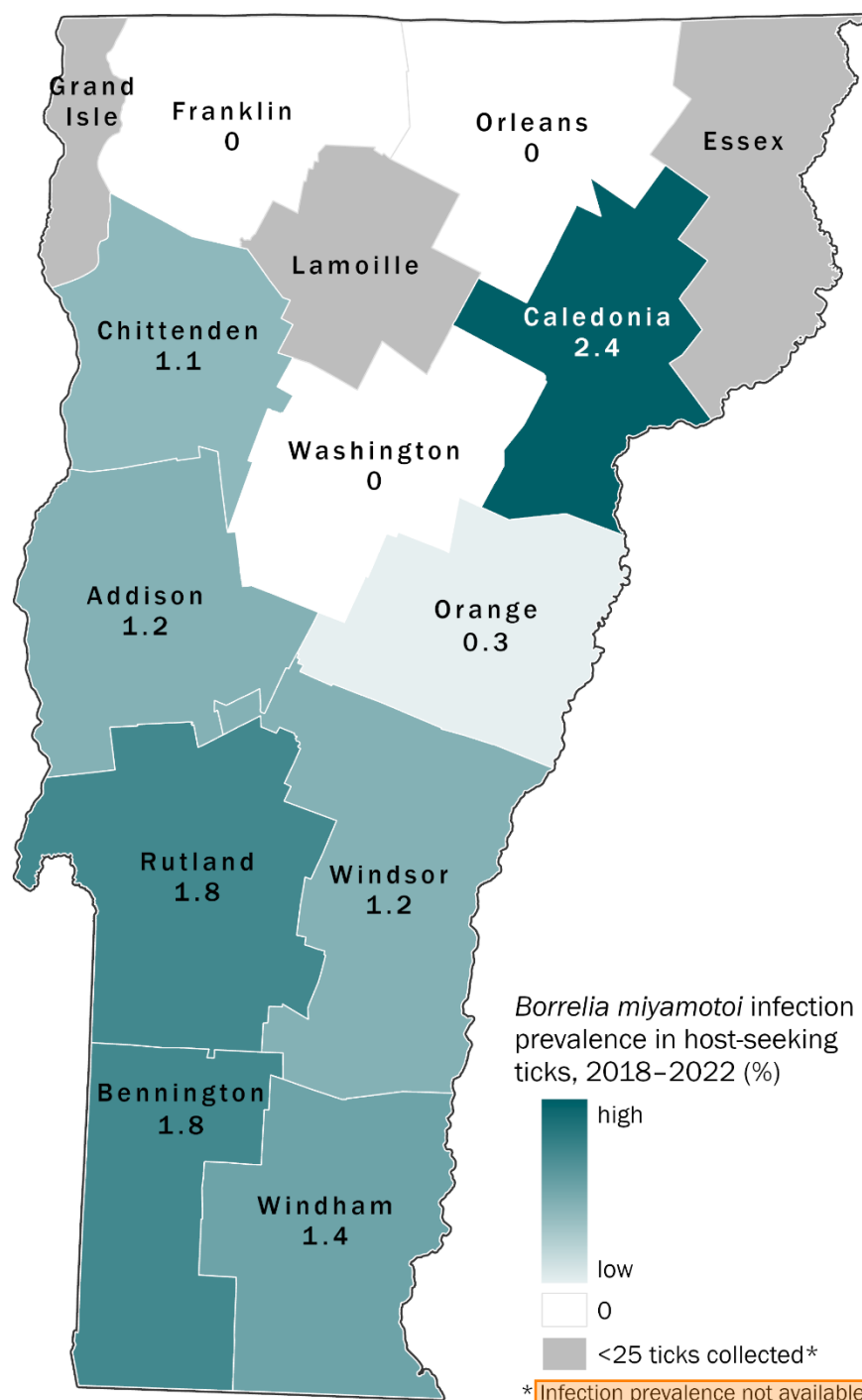


# 2018–2022 Tick Pathogen Surveillance Report

## *Borrelia miyamotoi* (hard tick relapsing fever)

*Borrelia miyamotoi* is a bacterium most recently recognized to cause tickborne disease in humans. The first infection in a Vermont resident was reported in 2016.

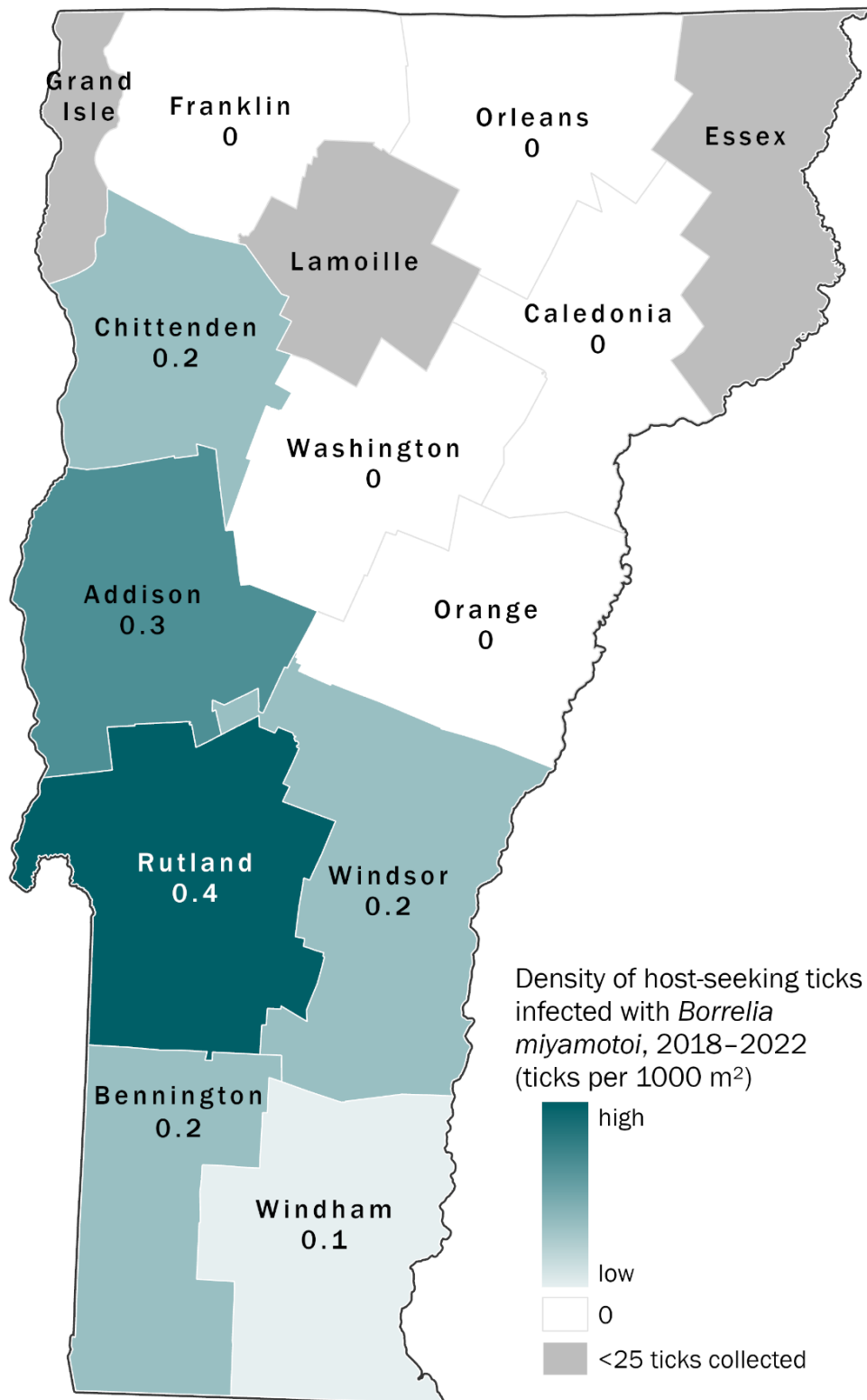
**During 2018–2022, Caledonia, Rutland, and Bennington Counties had the highest *Borrelia miyamotoi* infection prevalences among host-seeking (adult females and nymphs) blacklegged ticks.**





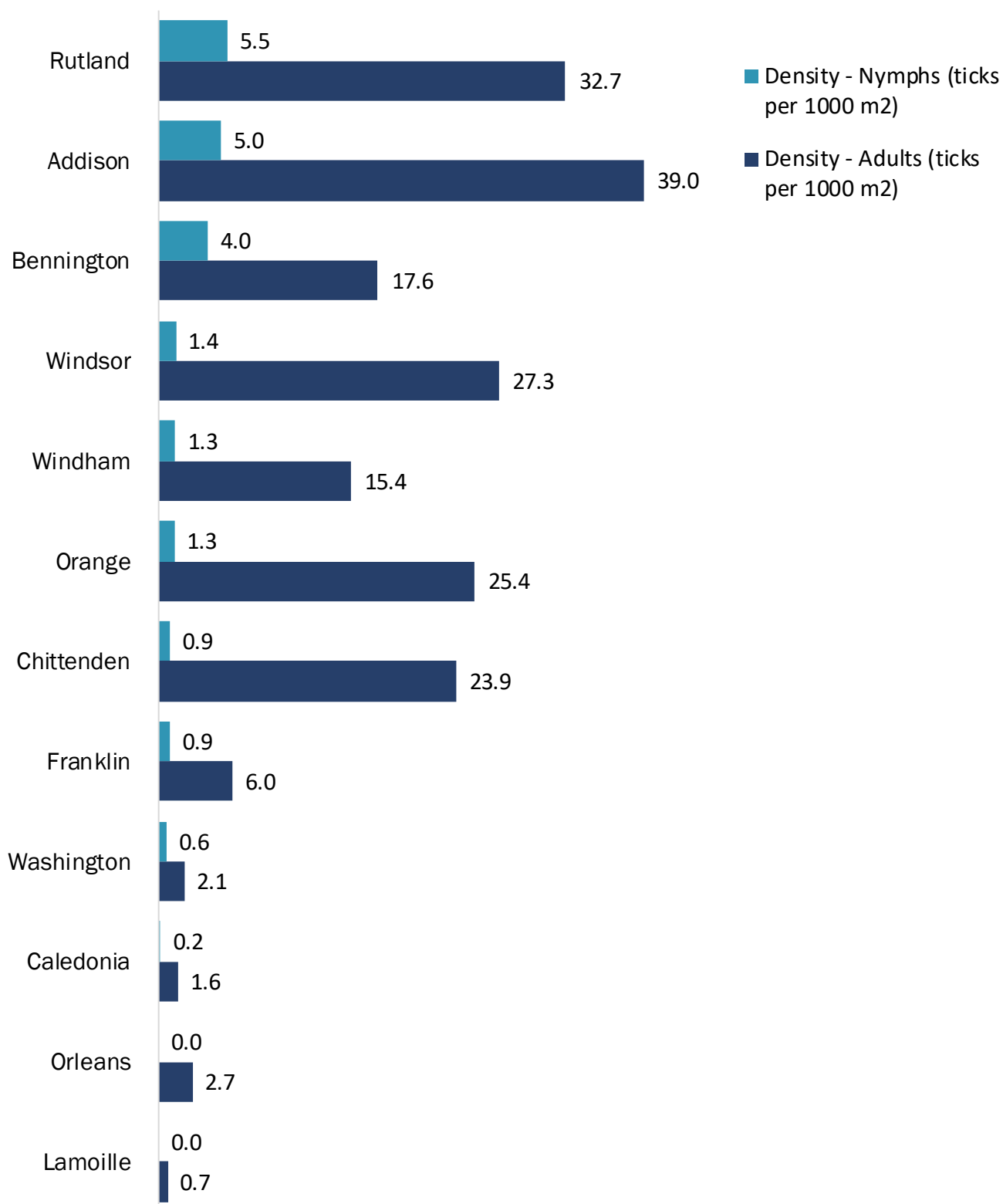
## 2018–2022 Tick Pathogen Surveillance Report

During 2018–2022, Rutland, Addison, and Bennington Counties had the highest densities of host-seeking (adult females and nymphs) blacklegged ticks infected with *Borrelia miyamotoi*.



# 2018–2022 Tick Pathogen Surveillance Report

During 2018–2022, Addison County had the highest density (per 1,000 m<sup>2</sup>) of adult ticks and Rutland County had the highest density (per 1,000 m<sup>2</sup>) of nymphal ticks.



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## Key Takeaways

Almost all tickborne disease cases reported to the Vermont Department of Health are caused by the blacklegged tick. Infected blacklegged ticks capable of spreading disease are most common in the southern half of Vermont. The best way to prevent tickborne disease is to prevent tick bites.

Take action to reduce your risk of infection. Wear repellent containing up to 30% DEET, check your body and pets daily for ticks, and limit your exposure to ticks and tick habitat.



For more information about tick bite prevention: [Be Tick Smart](#)

For more information about ticks in Vermont: [Ticks in Vermont](#)

For more information about tickborne diseases: [Tickborne Diseases](#)

For information about other tick surveillance activities in Vermont: [Tick Surveillance](#)