

2015 Vermont Survey for Tick-Borne Diseases

During the spring and fall of 2015, the Vermont Agency of Agriculture, Food & Markets (VAAFMM) surveyed ticks in Vermont for 3 tick-borne pathogens, *Borrelia burgdorferi*, *Anaplasma phagocytophilum*, and *Babesia microti*, all potentially transmitted by the black-legged tick, *Ixodes scapularis*.

Twenty-one towns were surveyed, representing 7 Vermont counties. With the exception of 1 site in Bennington, all sites were selected randomly from Delorme Atlas Maps. The site in Bennington had been sampled twice before. We included this site because we wanted to see how tick populations at the same site vary over time.

At each site, (2) or (4) 100-meter transects were surveyed for ticks. Tick flags made from 1 square meter of white flannel were swept back and forth, stopping every 10 meters. Ticks removed from the flag were placed into vials containing 95% ethyl alcohol. In the Berlin laboratory, ticks were identified to species and placed in individual PCR tubes for testing. The VAAFMM laboratory in Burlington tested for the 3 pathogens using RT-PCR testing. The laboratory tested 708 ticks collected during the 2015 season. Of these, 43 ticks were collected from clothing and 6 from horses.

Transects were 100 meters
Ticks were collected every 10 meters
Counties surveyed: 7
Towns surveyed: 21
Sites surveyed: 23
Transects surveyed: 68

Ticks collected from 2015 spring survey: 72
Ticks collected from 2015 fall survey: 589
Ticks tested from transects: 659

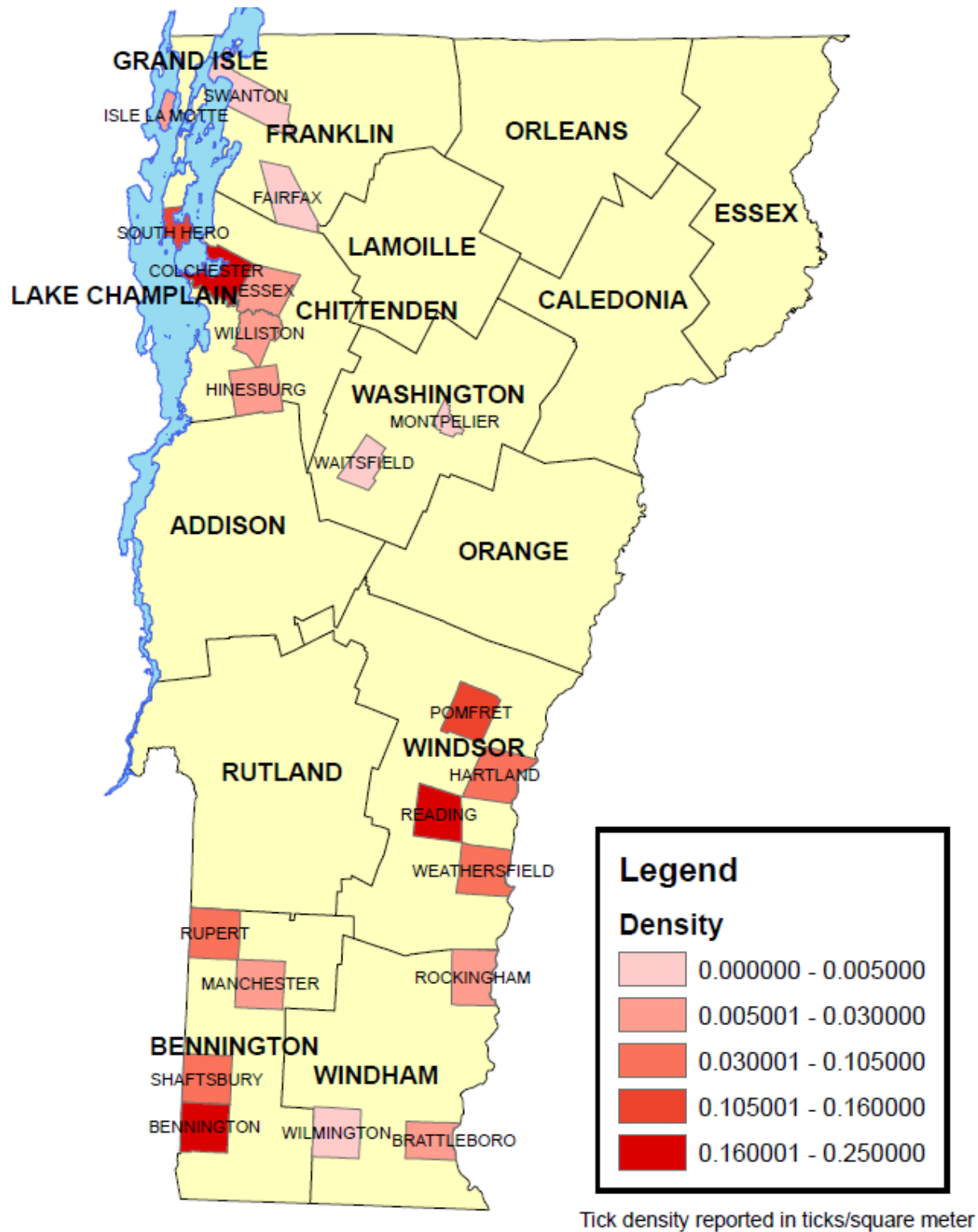
Vermont Towns and Counties Surveyed in 2015



Vermont Tick Survey Sites in 2015



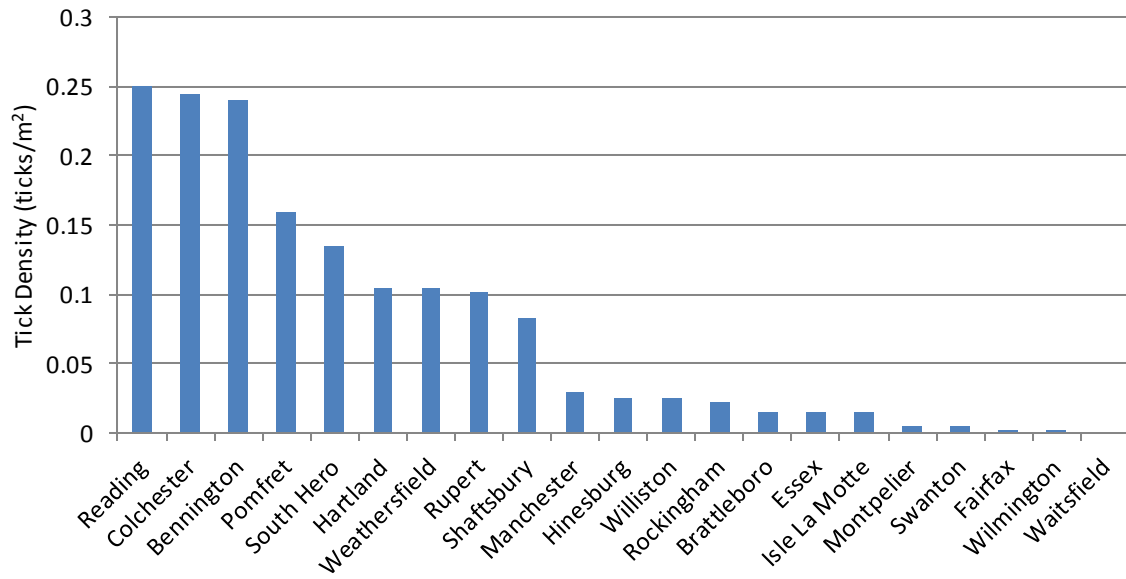
Average Density of Ticks (ticks/m²) in Vermont Towns Sampled



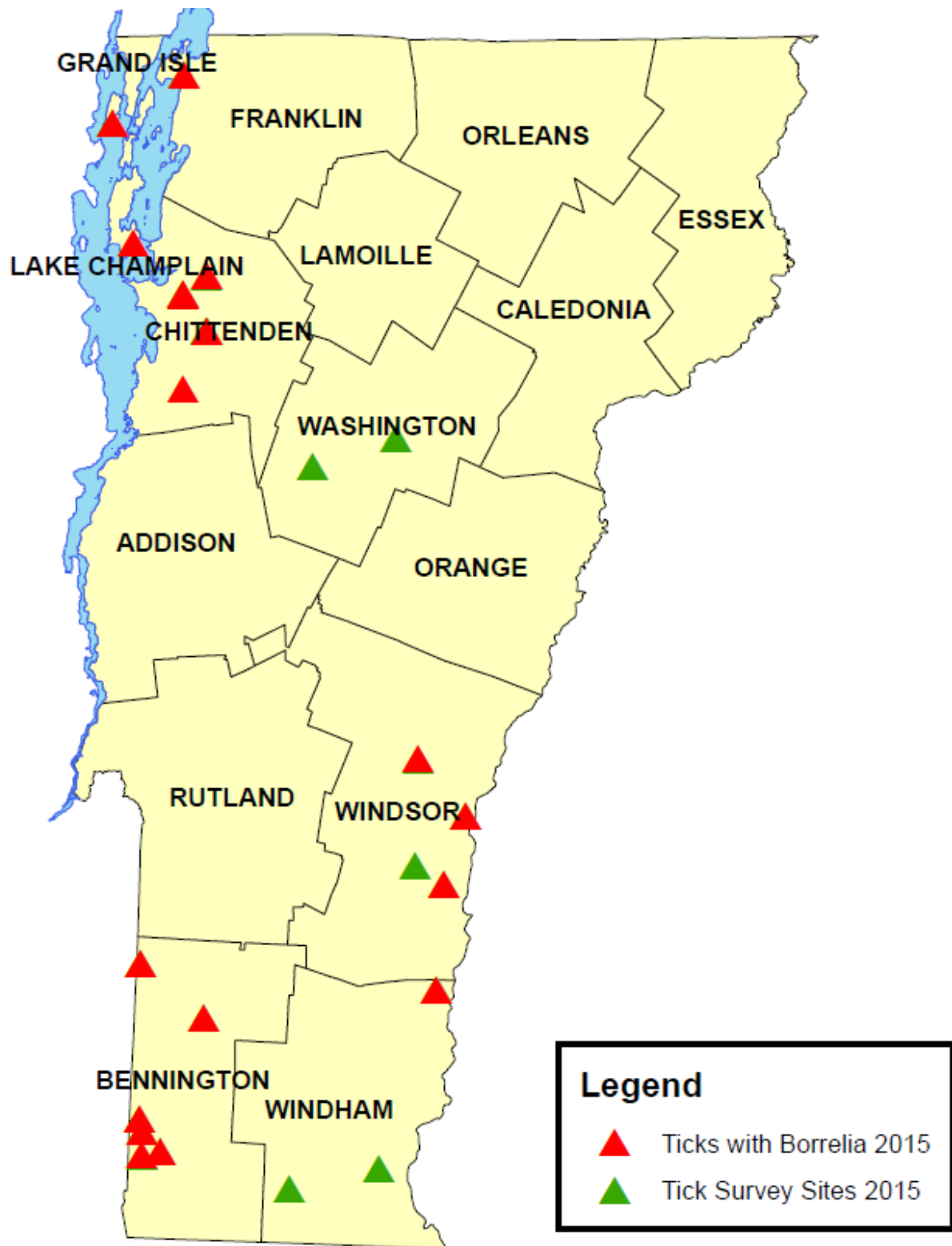
All transects and sites in the same town were combined.

A density of 0.25 ticks/m² means there was an average of 1 tick every 4 m² (43 square feet).

Tick Densities in Selected Vermont Towns



Vermont Collection Sites Positive for *Borrelia burgdorferi* (Lyme disease)



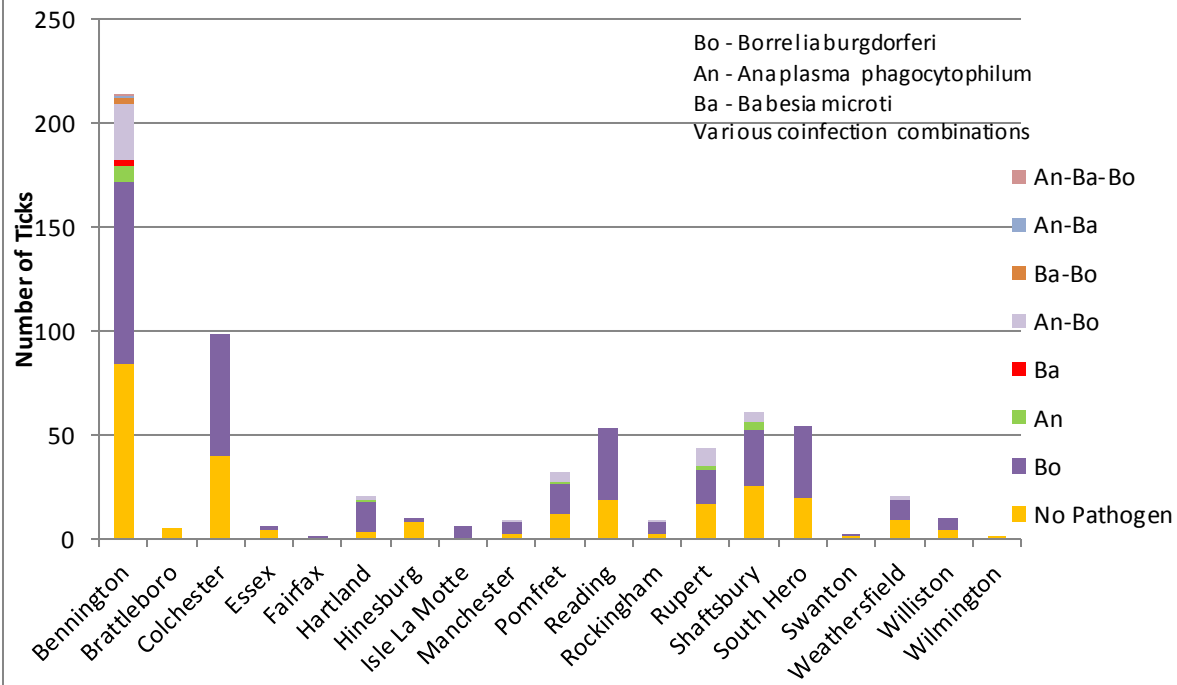
Vermont Collection Sites Positive for *Anaplasma phagocytophilum* (Anaplasmosis)



One site in Vermont had the pathogen *Babesia microti*, a newly detected tick-borne pathogen (Babesiosis) found in Vermont.



2015 Vermont Tick Survey Results



659 Ticks From 68 Transects of 100 m²

	#Ticks	Percent
<i>Anaplasma phagocytophilum</i>	69	10.5%
<i>Borrelia burgdorferi</i>	383	58.2%
<i>Babesia microti</i>	5	0.8%
No pathogens detected	256	38.9%
(some ticks are counted more than once due to co-infections)		
2/5 Nymphs infected with <i>Anaplasma</i>	2	40.0%
Co-infections		
An-Ba	1	0.2%
An-Bo	52	7.9%
Bo-Ba	3	0.5%
An-Bo-Ba	1	0.2%

	Number	<i>Borrelia</i>	Percent	<i>Anaplasma</i>	Percent	<i>Babesia</i>	Percent
Males	353	196	55.52	38	10.76	1	0.28
Females	300	187	62.33	29	9.67	4	1.33
Nymph	5	0	0.00	2	40.00	0	0.00
Larvae*	1	0	0.00	0	0.00	0	0.00

* 6 larvae were pooled into a single sample for testing

Risk for Tick Pathogens Listed by Vermont Town

Town	Density (Ticks/m ²)	Number of Ticks Tested	% <i>Borrelia</i>	% <i>Anaplasma</i>	% <i>Babesia</i>
Bennington	0.24	216	49.2	21.0	2.3
Brattleboro	0.015	6			
Colchester	0.245	98	55.1		
Essex	0.015	6	33.3		
Fairfax	0.0025	1	100.0		
Hartland	0.105	21	81.0	14.3	
Hinesburg	0.025	10	4.5		
Isle La Motte	0.015	6	100.0		
Manchester	0.03	9	77.8	11.1	
Montpelier	0.005	1			
Pomfret	0.16	32	59.4	18.8	
Reading	0.25	50	68.0		
Rockingham	0.0225	9	77.8	11.1	
Rupert	0.1025	41	61.0	26.8	
Shaftsbury	0.0825	66	46.1	13.3	
South Hero	0.135	54	56.7		
Swanton	0.005	2	50.0		
Waitsfield	0	0			
Weathersfield	0.105	21	57.1	9.5	
Williston	0.025	10	60.0		
Wilmington	0.0025	1			

Variability of Tick Density by Site

