

TICKS AND TICK-BORNE DISEASES IN NEW HAMPSHIRE

BeBop Labs' Mission

BeBop Labs has nonprofit 501(c)(3) status to research, gather, and disseminate scientific data and knowledge to the public on impacts to health and environment, and supply public access to a collaborative science laboratory to educate, invent, and empower local individuals.

BeBop Labs' Vision

BeBop Labs' vision is to create and foster a scientifically-minded community that actively works together to tackle issues affecting human health and our environment.

BeBop Labs' Impact

We are currently gathering information on ticks and tick-borne disease throughout NH.

In the future we will test for microbial presence in other vectors and environmental sources as well as provide public access to a collaborative science laboratory for our community to solve their unsolved problems.



Find Out More Information About Us

- 🖈 BebopLabs.org 💿 💌 info@BebopLabs.org
- f facebook.com/BebopLabs
- instagram.com/BebopLabs

TICK REMOVAL TWEEZERS



Bebop Labs is selling dual tipped stainless steel tick removal tweezers. More info on the next page.



Tick-borne diseases (TBD) have been increasing in New England at alarming numbers, but surveillance efforts do not yield enough information to understand the local distribution of tick vectors and their disease burden, patterns and trends. Human-tick and pet-tick interactions are crucial to consider when assessing the risk of TBD and the changes due to climate change.

BeBop Labs works to transform the way people monitor and understand their health and encourages them to make choices to improve it. Using citizen scientists we tracked ticks and TBD aiming to get location specific risks, create maps and statistically significant trends that help predict future problems.



Bebop Labs is selling dual tipped stainless steel tick removal tweezers. They are safe for removing ticks of all sizes on humans and pets. The hook side is useful for removing engorged or larger ticks. The forceps side is useful for removing small ticks. Each tweezer is \$9.99. Get 10% off when you order ten or more tweezers at a time. All purchases are tax deductible and considered a donation.

BebopLabs.org/Products

TICK REMOVAL





Pull straight up.

According to the Center of Disease Control:

- **Step 1**: Use fine-tipped tweezers or your fingers to grasp the tick as close to the skin's surface as possible. Make sure to get the mouth.
- Step 2: Pull upward with steady, even pressure. Don't twist or jerk the tick, so that the tick remains in tact.
- **Step 3**: Do not discard tick. Place tick in sealed bag for testing.

\$999 **FREE SHIPPING!** TAX DEDUCTIBLE!

BULK DISCOUNT: \$8.99 each if you order 10+ tweezers! Code: 10%OFF



Includes information brochure about tick identification, tick removal instructions, and prevention tips!

Deg Ticks Dermacentor variabilis Dermacentor





Citizen Science

Citizen scientists collect ticks from NH through a free program. Submitted ticks were identified by species, sex, stage, location they were collected (specific as town, street address, and latitude and longitude), activity the individual was doing when the tick found, species of tick victim (i.e. human, dog, etc.), and if the tick was biting or crawling. For biting ticks, we also collected age and location the tick was biting. Primarily Blacklegged ticks (aka deer ticks) and some American Dog ticks were tested for the presence of Borrelia sp, B. burgdorferi s. l., B. miyamotoi, B. mayonii, B. microti, and A. phagocytophilum by a PCR machine (thermal cycler).

Number of collected ticks: in 2018, 700, and in 2019, 4,695, and 1586+ in 2020 (2020 data not included). Including 5,395+ unique data points on an **interactive map** and 2,094+ ticks tested ticks over the course of 3 years.

BeBop Labs Crowdsources for Ticks

Put tick in zip-lock bag or tape and mail it with the following info to us.

BeBop Labs PO Box 183 Salisbury, NH 03268



TICK COLLECTION QUESTIONS

- 1. **DATE** tick was found.
- 2. NUMBER of ticks found.
- 3. LOCATION tick was found (Street or GIS coordinates)
- 4. ACTIVITY during tick discovery.
- 5. **ON WHOM** tick was found (Human, pet)
- 6. TICK BITING or CRAWLING.

If **BITING**, where on person/pet. If **BITING** human, age of person.



Interactive Map

Check out where ticks are located.

BebopLabs.org/Mapping-Ticks







State-wide Risk Maps

Alongside our interactive map, we created statewide risk maps informing the differences of location of D. variabilis and I. scapularis and their TBD exposure at locations as detailed by town.

The pathogen prevalence was 36% Lyme, 5% Anaplasmosis, 5% Babesiosis, and 1% B. miyamotoi.



Consistently BeBop Labs data from 2018 and 2019 show approximately 40% ticks from Belknap, Carroll, Grafton, and Strafford county carry Lyme disease.











Visit our website for town information, and eventually, park information will be posted there when we have enough data.

BebopLabs.org/ Mapping-Ticks





Ticks Prefer:

- Tall grass
- The area between a field and a forest
- Leaf debris
- Areas heavy with mice or other small rodents
- People who are hot, hairy, and breathe heavy
- Hypothesis: Dog ticks prefer wet, marshy area

Participate in our Survey

You can help us collect data on your behaviors and understandings by taking our survey on our website. This will help us direct the research and educational fliers so we answer your questions.

BeBopLabs.org/tick-survey

Prevention Tips

Now you know your risk of tick-borne diseases in your area. Try these proven prevention methods. And remember to save your ticks!



Create a Tick-Safe Zone through Landscape

- **1** Mow Lawn Keep your lawn mowed.
- 2 **Rake Leaves** Keep leaves raked and in a pile away from traffic. Leaves are where ticks lay their eggs.
- **3 Wood Pile** Put tick tubes on wood piles and stone walls where there are a lot of small rodents for ticks to feed on.
- 4 Wood Chips Make a perimeter with wood chips (cedar is best or pine) or use a spray like bifenthrin to protect the tick-free zone. But sprays also kill our bees.
- **5** Keep Ferns Leave ferns because they have a natural pesticide.





TICK AND TICK BORNE-DISEASE ISSUE

BeBop Labs is the only organization in NH that tracks ticks and tick-borne diseases. Thus our organization is part of Prevention and Awareness, Surveillance, and Diagnosis. All of our efforts are because of the help of citizen scientists. With the changing climate it is now a necessity to continually track our risk of tick-borne diseases especially in our northern and underserved state of New Hampshire.



What BeBop Labs Does

- Creating an interactive tick distribution map throughout New Hampshire
- Identifying infected ticks in your area
- Accurately mapping risk areas
- Educating the public about ticks and tick-borne diseases
- Notifying the public about specific at risk areas

Donations

Donations help fund research and solutions to prevent Lyme disease. 100% of donations go directly to supporting our purpose. Your donation is **tax deductible**. Donate online or mail checks to Bebop Labs PO Box 183, Salisbury NH 03268.

BebopLabs.org/donate

Dedicated to Bebop



OUR TICK DATA

Time of Year we Find Ticks

There is only 1 season for Dog Ticks

- Spring-summer
- Peaks in June

There are 2 seasons for Blacklegged Ticks (aka BLT and Deer ticks):

- Spring season peaks in May
- Fall season peaks in October
- We see BLT as early as March

Time of Year we Find Tick Borne Diseases in New Hampshire

Dog ticks peaked in June and Blacklegged ticks (deer ticks) peaked in May and October, corresponding with peaks of Lyme disease and somewhat anaplasmosis.

Time of Year we find Co-infections

Spring and fall are the seasons in which we find the most percentage of ticks co-infected.

Stage of Growth of Blacklegged ticks (deer tick) that contain Disease

Collected nymphs were mostly disease free, with about equal amounts of adults contained disease as didn't.



Please feel free to ask questions and make suggestions.