

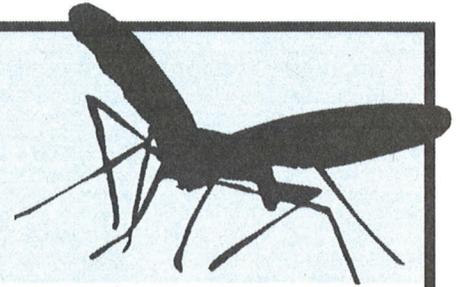
EEE Risk Levels & Recommended Personal Protection Measures

Risk Category	Definition of risk category	Recommended Personal Protection Measures
Baseline/ No mosquito surveillance	<p><i>Prior 2 years:</i> No human or veterinary cases reported</p> <p><i>Current year:</i> No mosquito surveillance available in this region</p> <p>- AND - No human or veterinary cases reported</p>	<p>Take general precautions to prevent mosquito bites:</p> <p>Use mosquito repellents, especially from dusk to dawn when mosquitoes are most active.</p> <p>Weather permitting, wear long sleeves and long pants when outdoors from dusk to dawn.</p> <p>Cover baby carriages or outdoor play spaces with mosquito netting.</p> <p>Make sure screens in your doors and windows are intact.</p> <p>Remove standing water around your house.</p>
Low Risk	<p><i>Prior 2 years:</i> EEE virus detected in mosquitoes</p> <p>- OR - <i>Current year:</i> EEE virus detected in mosquitoes at a single trapping site</p> <p>- AND - No human or veterinary cases</p>	<p>Remove standing water around your house.</p> <ul style="list-style-type: none"> • Dispose of or regularly empty any water-holding containers. • Drill holes in the bottom of recycling containers that are left outdoors. • Clean clogged roof gutters of leaves and debris that might prevent water to drain. • Change water in bird baths every three or four days. Don't let the water stagnate. • Keep swimming pools clean and properly chlorinated. Remove standing water from pool covers. <p>Arrange neighborhood clean-ups to get rid of mosquito breeding sites.</p>
Moderate Risk	<p><i>Prior 2 years:</i> Confirmation of human and/or veterinary case</p> <p>- OR - Sustained viral activity in mosquitoes</p> <p>- OR - <i>Current year:</i> No animal or human cases in current year</p> <p>- AND - Sustained EEE virus isolations from mosquitoes at one location - <i>or</i> - multiple locations within a community - <i>or</i> - EEE virus isolated from bridge vectors</p> <p>Definition – Sustained: when mosquito activity is detected for two or more weeks within one focal area</p>	<p>Take additional precautions to prevent mosquito bites:</p> <p>Limit time spend outdoors from dusk to dawn. This is when mosquitoes are most active.</p> <p>Whenever you go outside, apply mosquito repellent.</p> <p>Be aware of whether mosquitoes are biting, and go inside or apply more repellent if mosquitoes are active.</p> <p>Weather permitting, wear long sleeves and long pants.</p> <p>Cover baby carriages or outdoor play spaces with mosquito netting.</p> <p>Make sure screens in your doors and windows are intact.</p> <p>Remove standing water around your house.</p> <ul style="list-style-type: none"> • Dispose of or regularly empty any water-holding containers. • Drill holes in the bottom of recycling containers that are left outdoors. • Clean clogged roof gutters of leaves and debris that might prevent drainage of water. • Change water in bird baths every three or four days. Don't let the water stagnate. • Keep swimming pools clean and properly chlorinated. Remove standing water from pool covers. <p>Arrange neighborhood clean-ups to get rid of mosquito breeding sites.</p>

High Risk	<p><i>Current year:</i> A single confirmed human or veterinary case</p> <p>- OR -</p> <p>Sustained or increasing viral activity in mosquitoes in the community</p>	<p>Take even more precautions to prevent mosquito bites:</p> <p>Stay inside as much as possible from dusk to dawn. This is when mosquitoes are most active.</p> <ul style="list-style-type: none"> • If you must go outside during these hours, wear long pants and long sleeves and use mosquito repellent. <p>Consider cancelling or rescheduling outdoor gatherings, such as organized sporting events, during peak mosquito hours.</p> <p>Apply mosquito repellent whenever you go outside, even if you do not think mosquitoes are biting.</p> <p>Be aware of whether mosquitoes are biting, and go inside or apply more repellent if mosquitoes are active.</p> <p>Wear long sleeves and long pants when outside, weather permitting.</p> <p>Cover baby carriages or outdoor play spaces with mosquito netting.</p> <p>Make sure screens in your doors and windows are intact.</p> <p>Remove standing water around your house.</p> <ul style="list-style-type: none"> • Dispose of or regularly empty any water-holding containers. • Drill holes in the bottom of recycling containers that are left outdoors. • Clean clogged roof gutters of leaves and debris that might prevent water from draining. • Change water in bird baths every three or four days. Don't let water stagnate. • Keep swimming pools clean and properly chlorinated. Remove standing water from pool covers. <p>Arrange neighborhood clean-ups to get rid of mosquito breeding sites.</p>
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Eastern Equine Encephalitis

2013 Human Study Results



In 2013, The Vermont Department of Health and the Centers for Disease Control and Prevention conducted a study to learn more about Eastern equine encephalitis in Vermont.

What is Eastern equine encephalitis?

Eastern equine encephalitis (EEE) is a rare but serious viral disease. It is spread by mosquitoes and most commonly affects people and horses. It does not spread from person to person or from mammal to mammal. Other species that can become ill include emus, alpacas, llamas and other equids. In recent years, EEE has been found in people, animals and mosquitoes in northern Rutland and southern Addison Counties.

What was the goal of the study?

The goal of the study was to learn if people in three Vermont towns were infected with Eastern equine encephalitis virus without realizing it. With most infections, some people have mild or no symptoms, but we don't know how common this is with EEE virus infections.

Who participated in the study?

Residents of Brandon, Whiting, or Sudbury, Vermont who were 12 years or older at the time of the study were eligible to participate. These towns were selected because evidence of EEE virus had been found in these locations in 2012. The study was done in April and May of 2013.

What was involved with participating in the study?

Eligible individuals were asked to complete a brief survey and to provide a small blood sample. The blood was tested for antibodies to EEE virus at the Centers for Disease Control and Prevention.

What were the results of the study?

In all, 364 blood samples were tested for antibodies to EEE virus. This was about eight percent of the total population of the three towns. All samples tested negative for antibodies against EEE virus. This means that there was no evidence that anyone in the study group had been bitten by an infected mosquito.

What do the results mean?

The results suggest that infection with EEE virus is uncommon. The results also suggest that EEE infections that are mild or cause no symptoms are uncommon. Because no one tested positive, we cannot make any conclusions about which behaviors or activities might put someone at risk for getting bitten by an infected mosquito.

It is important to keep in mind that this is one small study, and these results may not exactly describe what is happening in the community. The median age of the participants was 60 years. This is substantially higher than the median age of Vermonters, which is 42 years. Besides being older, people who chose to participate in the study may be different in other ways than people who chose not to participate. For example, people who participated in the study might not have had as much exposure to mosquitoes as typical residents of these towns.

We expect that infections with EEE virus in your area and in Vermont will remain rare. However, because infections may result in serious illness or death, it is important for people to prevent mosquito bites.

2.2014

For more information – healthvermont.gov

Information: 802-863-7240



What is Eastern equine encephalitis?

Eastern equine encephalitis (EEE) is a rare but serious disease caused by a virus and spread by infected mosquitoes. The disease most commonly affects people and horses, but illness has been reported in other animals including alpacas, llamas, donkeys, pheasants and emus.

Do we have EEE virus in Vermont?

EEE has recently been detected in Vermont. In 2012, two residents of Rutland County were confirmed to have of EEE. This is the first time that human illness was reported in the state. In 2013, no people became ill but two horses in Franklin County died from this disease.

In 2010 and 2011 blood was collected from deer and moose during hunting season, and evidence of current or prior infection was found in these species. This was the first time evidence of EEE virus had ever been found in Vermont. In 2011, several emus in a large flock died from EEE virus infection. This was the first illness in an animal documented in Vermont.

Although EEE virus has caused illness in just a few areas of the state, there is evidence that the virus is present in other parts of Vermont, so all Vermonters should [take precautions to avoid mosquito bites](#).

How is eastern equine encephalitis virus spread?

EEE virus is transmitted by the bite of an infected mosquito. EEE virus typically infects birds, and in most years it remains in bird populations, posing minimal danger to humans and horses. Mosquitoes become infected by feeding on infected birds. If an infected mosquito bites a horse, human or other susceptible animal, the animal or person can become sick. The virus that causes EEE is only spread by mosquitoes. People, horses and deer do not spread the disease.

What are the symptoms of EEE?

Symptoms of EEE typically occur 4 to 10 days after a bite from an infected mosquito. The severity of the illness is quite variable, and some people bitten by an infected mosquito may not become ill. Most people who become ill experience a flu-like illness with fever, headache, muscle aches, joint pain and fatigue. This illness can last 1 to 2 weeks.

In rare cases, infection of the brain and spinal cord occurs, causing sudden high fever (103° to 106°F), stiff neck, and a headache that keeps getting worse. Inflammation and swelling of the brain, called encephalitis, is the most dangerous complication. The disease can sometimes worsen quickly. About 1/3 of people who develop encephalitis will die. Among those who survive, many are left with mild to severe disabilities. People over age 50 or younger than age 15 are at greatest risk for developing severe disease.

Who is at risk for getting EEE?

Anyone who spends time in an area where EEE virus activity has been identified is at risk of infection. Although the risk is thought to be low in Vermont, people should take steps to avoid mosquito bites. People who engage in outdoor work and recreational activities, especially near

wetlands and swamps, are at increased risk of infection. The risk of getting EEE is highest from late July through September.

What is the treatment for EEE?

There is no specific treatment for EEE. Treatment consists of supportive therapy to lower the fever and ease the pressure on the brain and spinal cord.

Is there a vaccine to protect humans from EEE?

No, there is no vaccine because EEE occurs so rarely in people. There is a very effective vaccine for horses, which can also be used in other susceptible animals.

How do you prevent EEE?

The best way to prevent EEE is to prevent mosquito bites. These steps will reduce your chance of being bitten by mosquitoes that carry EEE virus or other viruses, such as the West Nile virus.

- Wear long-sleeved shirts and long pants when you are outdoors.
- You may want to limit the amount of time you spend outdoors at dawn and dusk, or at other times when mosquitoes are active.
- Use insect repellents that are labeled as effective against mosquitoes. Proven effective ingredients include DEET (N, N-diethyl-meta-toluamide), Picaridin (KBR 3023), and oil of lemon eucalyptus (p-menthane 3,8-diol [PMD]). Be sure to carefully follow the directions on the label. Repellents should be applied sparingly to clothing and exposed areas of skin. They should not be applied to a child's face or hands, or to skin that is scratched or irritated. Wash skin where repellents were applied when mosquito exposure has ended.
- The repellent/insecticide permethrin can be used on clothing. It remains effective through several washes.
- Take special care to cover up the arms and legs of children playing outdoors.
- Cover baby carriages or outdoor playpens with mosquito netting.
- Fix any holes in your screens and make sure they are tightly attached to the doors and windows.
- Mosquitoes can lay eggs even in small amounts of standing water. Get rid of mosquito breeding sites by emptying standing water from flower pots, buckets, barrels, and tires. Change the water in pet dishes and replace the water in bird baths weekly. Drill holes in tire swings so water drains out. Empty children's wading pools and store on their side after use.
- If you own horses, donkeys, llamas or alpacas, ask your veterinarian about the vaccine.

Additional Information:

Centers for Disease Control and Prevention:

<http://www.cdc.gov/EasternEquineEncephalitis/index.html>

Vermont Department of Health: <http://healthvermont.gov/prevent/arbovirus/index.aspx>

What is West Nile virus?

West Nile virus is a disease caused by a mosquito-borne virus. West Nile virus first appeared in the United States in 1999, when at least 62 people in the New York City area got sick and seven people died. Since that time, the virus has spread throughout the United States, including Vermont. Horses are also commonly affected by this disease.

How do people get West Nile virus?

The vast majority of infections come from the bite of an infected mosquito. Mosquitoes are infected when they feed on an infected bird. When an infected mosquito bites a person, the virus is injected into the person and may cause illness. West Nile virus can also be spread by organ transplantation, blood transfusion, from a mother to fetus, and possibly by breast milk.

Although birds and other animals may be infected with West Nile virus, there is no evidence that a person can get the virus from handling live or dead animals. However, wear gloves whenever handling a dead animal, including birds.

If a mosquito bites me, will I get sick?

Most mosquitoes are NOT infected with West Nile virus. Even if an infected mosquito bites you, your chances of getting sick are low. Most people who are infected do not have any symptoms. Less than 1 percent of people who are infected develop severe illness, like encephalitis or meningitis. Another 20 percent of people who are infected have a milder illness.

People aged 50 and older have the highest risk of getting severely ill if bitten by a mosquito infected with West Nile virus.

What are symptoms of West Nile virus infection?

In milder illness, symptoms may include fever, headache, body aches, skin rash and swollen lymph glands. Symptoms can last for as little as a few days but can last for several weeks. With more severe illness, people may have headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis and, rarely, death.

How is West Nile virus infection treated?

There is no specific treatment for West Nile virus, but the symptoms can be treated. With severe illness, hospitalization and treatment in an intensive care unit may be required.

How common is West Nile virus in Vermont?

West Nile virus has been detected in dead birds, mosquitoes, and horses in Vermont. It is a relatively uncommon cause of illness in people. Since 2011, two or three infections in people have been reported each year. Prior to that, the most recent documented case of human illness was in 2003. West Nile virus continues to be detected in mosquitoes each year.

Additional Resources

Centers for Disease Control and Prevention: <http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>

Vermont Department of Health website: <http://healthvermont.gov/prevent/arbovirus/index.aspx>

What can I do to protect myself from West Nile virus?

To protect yourself, you can take steps to reduce mosquito breeding areas near your home and prevent mosquito bites.

What can I do to keep mosquitoes from biting?

- Wear long-sleeved shirts and long pants when you are outdoors.
- You may want to limit the amount of time you spend outdoors at dawn and dusk, or at other times when mosquitoes are active.
- Use insect repellent labeled as "effective against mosquitoes." Proven effective ingredients include DEET (N,N-diethyl-meta-toluamide), Picaridin(KBR 3023), and oil of lemon eucalyptus (p-menthane 3,8-diol [PMD]). Be sure to carefully follow the directions on the label. Repellents should be applied sparingly to clothing and exposed areas of skin. They should not be applied to a child's face or hands, or to skin that is scratched or irritated. Wash skin where repellents were applied when mosquito exposure has ended.
- The repellent/insecticide permethrin can be used on clothing. It remains effective through several washes.
- Take special care to cover up the arms and legs of children playing outdoors.
- Cover baby carriages or outdoor playpens with mosquito netting.
- Fix any holes in your screens and make sure they are tightly attached to the doors and windows.

What can I do to reduce the number of mosquitoes around my home?

- Mosquitoes need water to reproduce. They can breed in any puddle or standing water that lasts more than four days. By removing areas of standing water around your house, you will eliminate their breeding grounds and reduce the number of mosquitoes.
- Dispose of or regularly empty any metal cans, plastic containers, ceramic pots, and other water holding containers (including trash cans) on your property.
- Pay special attention to discarded tires. Tires are a common place for mosquitoes to breed.
- Drill holes in the bottom of recycling containers that are left outdoors so water can drain out.
- Clean clogged roof gutters of leaves and debris that prevent drainage of rainwater.
- Turn over plastic wading pools and wheelbarrows when not in use.
- Do not allow water to stagnate in birdbaths. Change it every three or four days.
- Aerate ornamental ponds or stock them with fish.
- Keep swimming pools clean and properly chlorinated. Remove standing water from pool covers.
- Use landscaping to eliminate standing water that collects on your property.
- If you own horses, donkeys, llamas or alpacas, ask your veterinarian about the vaccine.

Additional Resources About Preventing Mosquito Bites

Centers for Disease Control and Prevention:

http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm

Environmental Protection Agency: <http://cfpub.epa.gov/oppref/insect/>

What is Lyme disease?

Lyme disease is caused by infection with *Borrelia burgdorferi*, a type of bacteria called a spirochete. In the eastern U.S., the infection is transmitted by the bite of the black-legged tick, *Ixodes scapularis*, commonly known as the deer tick. Lyme disease, which can affect the skin, heart, nerves, or joints, can be effectively treated with antibiotic therapy.

Do we have Lyme disease in Vermont?

We do have Lyme disease in Vermont. For many years, only a few cases of Lyme disease were reported to the Vermont Department of Health each year. However, starting in 2005, that number started to increase steadily. The increase in reported cases has more or less continued each year. In recent years there have been several hundred reports of people with Lyme disease who were likely exposed in Vermont. Most of the reported cases have occurred in people who live in the southern half of our state, but illness has been reported from all areas of Vermont.

What are the symptoms of Lyme disease?

The symptoms of Lyme disease can vary because different parts of the body may be affected. The skin, joints, nerves or heart may be involved.

Early symptoms of Lyme disease typically appear within 3 to 30 days after a tick bite and include one or more of the following:

- Fatigue
- Chills and fever
- Muscle and joint pain
- Headache
- Swollen lymph nodes
- Erythema migrans: **Erythema migrans (EM)** is a characteristic skin rash associated with Lyme disease. It occurs in up to 80% of people. The EM rash usually appears as an expanding rash at or near the site of the tick bite. On occasion, the rash can appear on a different part the body than where the tick bite occurred and also in multiple places at the same time. The rash usually appears within seven to 14 days. The center of the rash may clear as it spreads, giving it the appearance of a bull's-eye. The rash may be warm, but it is usually not painful or itchy.

Infections that are not recognized and treated in the early phase may spread to other parts of the body, a condition called disseminated Lyme disease. Symptoms of disseminated disease can occur days to months after the initial infection. Some of the symptoms associated with disseminated disease include:

- numbness and pain in the arms or legs
- paralysis of facial muscles, usually on one side of the face (also known as Bell's palsy)
- fever, stiff neck, and severe headaches if meningitis occurs
- abnormal heart beat (rare)

Up to 60% of people, who do not receive treatment, develop intermittent bouts of arthritis several months after infection. The arthritis is characterized by severe joint pain and swelling usually of large joints, most commonly the knee. In addition, a small percentage of untreated people develop chronic nervous system problems months to years after infection. Such problems include shooting pains, numbness or tingling in the hands and feet, and problems with concentration and short term memory.

How is Lyme disease spread?

The spirochetes enter the body when an infected tick attaches to the skin to take a blood meal. In most cases, an infected tick must be attached for at least 36 hours in order to transmit Lyme disease. **Prompt removal of ticks can prevent infection.**

Not all types of ticks carry Lyme disease. In the eastern United States, the black-legged tick, commonly known as the deer tick, is responsible for transmitting the disease. Deer ticks are common in Vermont, but not all of them are infected with the bacteria.



From left to right: adult female, adult male, nymph, larvae. **Not to scale.** (scale: cm)

A history of a known tick bite will help the doctor to know if Lyme disease is the cause of an illness. However, many people with Lyme disease do not remember being bitten by a tick. Deer ticks are tiny and often go unnoticed. For example, nymphal deer ticks, the most common transmitters of Lyme disease, are quite small, usually about 2mm in size (see photo).

Who is at risk of getting Lyme disease?

Deer ticks live in wooded, brushy and grassy places, including gardens. Individuals at greatest risk are those who spend time outside in areas that have a lot of ticks that are infected with the spirochete. In the Northeast, most illness occurs during the spring when the nymphal ticks are most active and people spend a lot of time outside, often with large amounts of skin exposed.

What is the treatment for Lyme disease?

Appropriate treatment of Lyme disease with antibiotics almost always results in a full cure. While early treatment is best, most people diagnosed later in the course of illness can also be successfully treated.

How do you prevent Lyme disease?

The best way to prevent Lyme disease is to prevent tick bites.

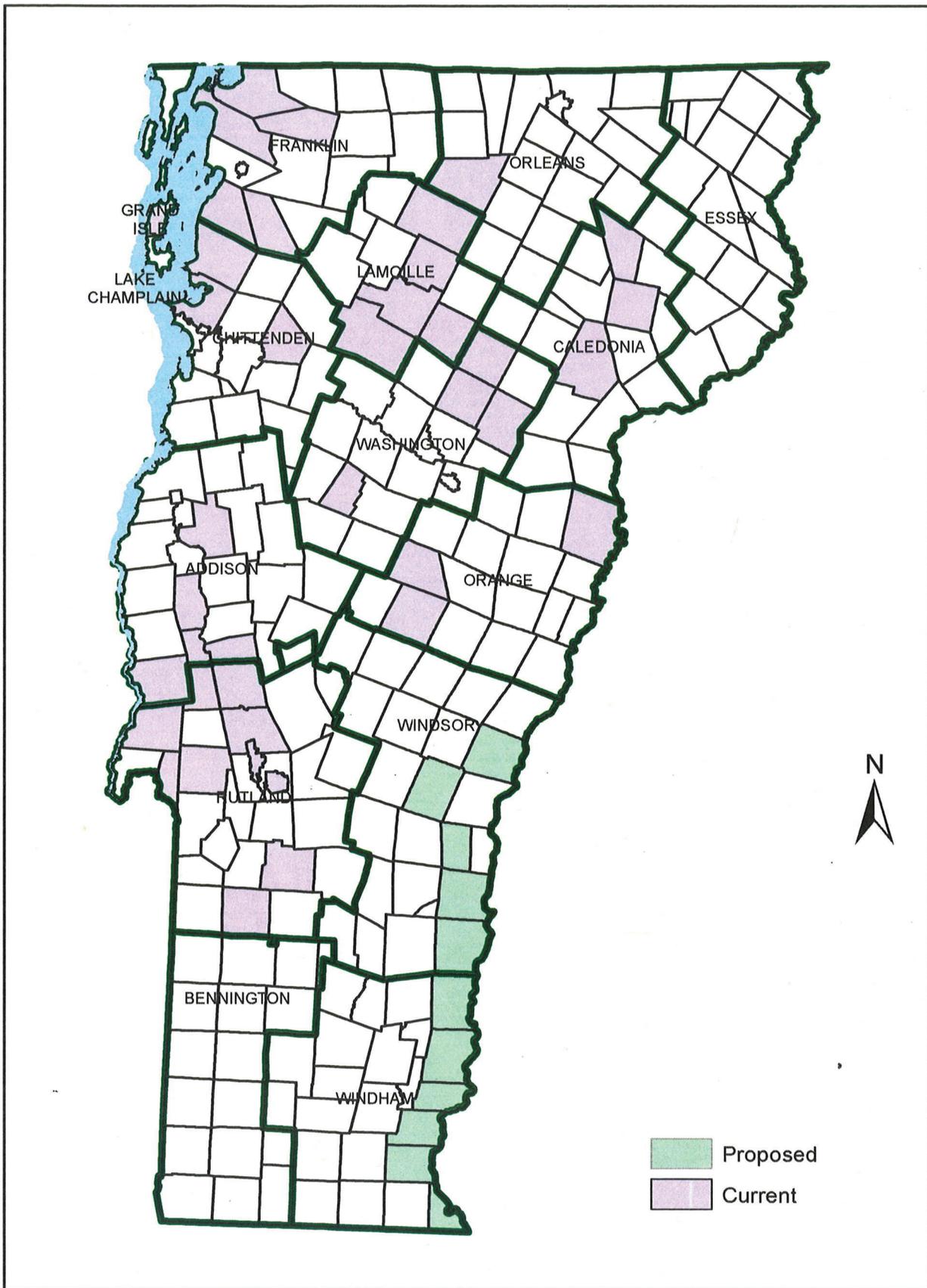
While outdoors:

- As much as possible, avoid high grass and bushy areas; stay on hiking trails.
- Wear long pants and long-sleeved shirts to minimize skin exposure to ticks.
- Tuck your pants into your socks to form a barrier to tick attachment.
- Wear light-colored clothing to help see ticks on your clothing.
- Check for ticks, looking particularly for what may look like nothing more than a new freckle or speck of dirt, and remove ticks promptly.
- Use an effective tick repellent on your skin or on your clothing. There are several repellents that are effective against ticks. For an up-to-date list of EPA registered products, see <http://cfpub.epa.gov/opprpref/insect/>. Repellents should not be used on infants under 2 months of age. Read the label carefully and use according to the recommendations.
- Permethrin is an insecticide that can be applied to clothing or gear. If you spend a lot of time in tick habitat, wearing permethrin-treated clothing can be very effective at reducing your exposure to ticks

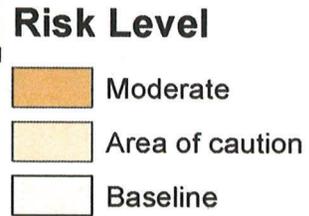
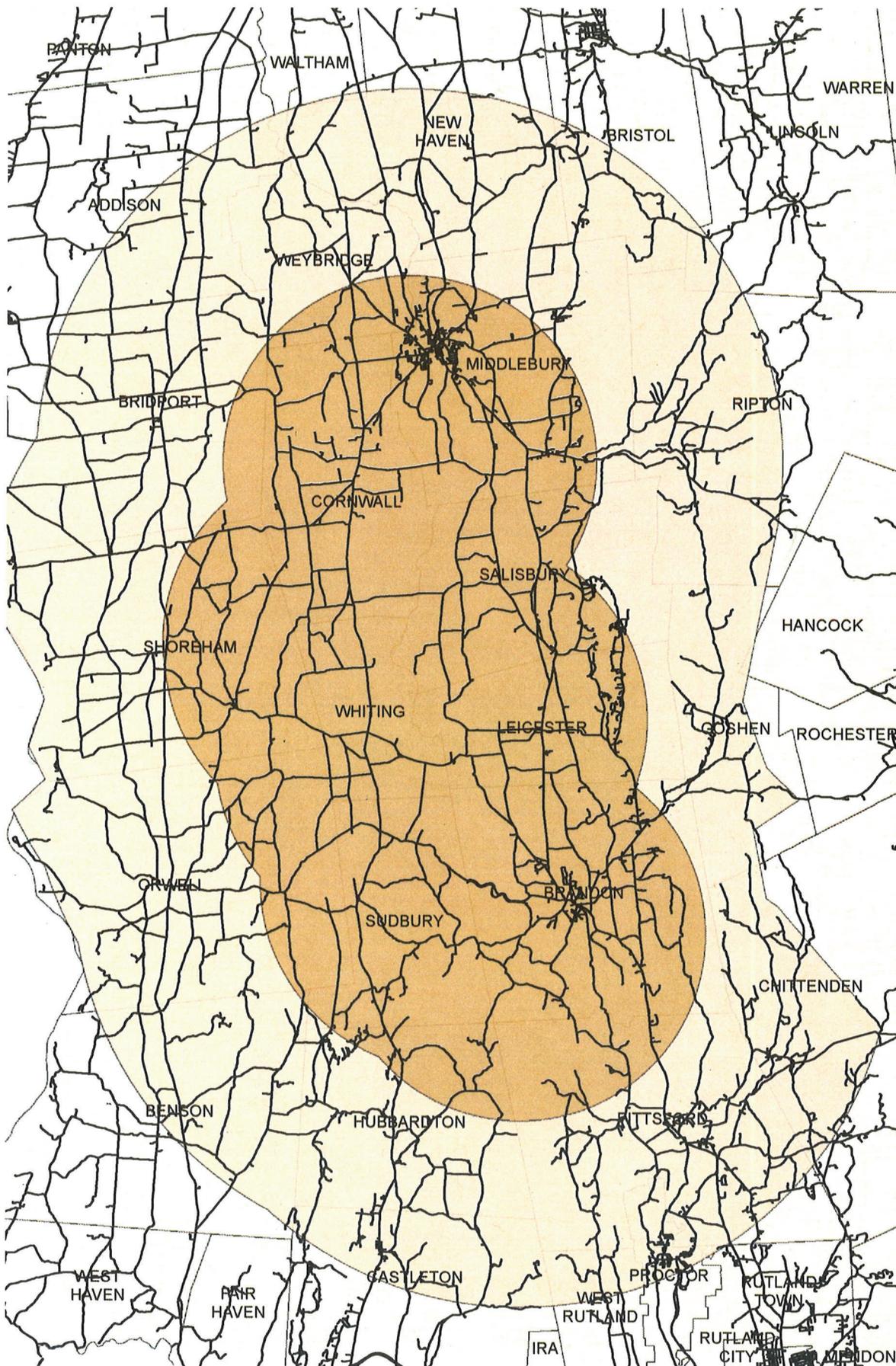
After you come inside:

- Check your or your child's body for ticks, and remove them promptly. Pay special attention to the head, armpits, and groin area.
- Showering within a few hours of coming in from outside may also be helpful.

2014: Towns with at Least One Mosquito Trap Site



2014 EEE Estimated Risk Addison and Rutland Counties



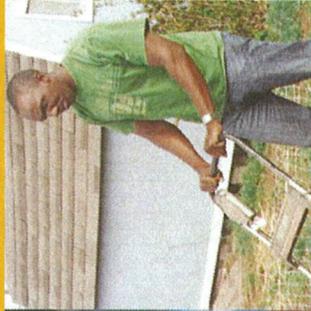
HOW DO I CHOOSE AN INSECT REPELLENT?



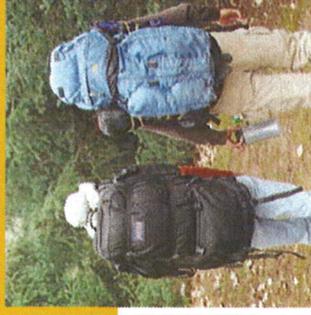
1-2 hours



2-4 hours



5 - 8 hours



ON SKIN

MOSQUITOES

Protection varies by species of mosquito.

Most mosquitoes that transmit diseases in the US bite from dusk-dawn.

TICKS

Other factors affecting efficacy include: individual chemistry, sweat, numbers of bugs. Apply creams and lotions 15 to 20 minutes before going outdoors.

Choose the appropriate repellent for the length of time you'll be outdoors. Reapply according to product instructions

<10% DEET
<10% picaridin

~15% DEET
~15% picaridin/KBR 3023
~30% oil of lemon eucalyptus/PMD

~20%-50% DEET

Generally, repellent with 20 - 50% DEET is recommended to protect against tick bites.

In areas where both mosquitoes and ticks are a concern, repellents with 20 - 50% DEET may offer best, well-rounded protection.

The American Academy of Pediatrics has recommended that repellents containing up to 30% DEET can be used on children over 2 months of age.

The repellents shown here meet CDC's standard of having EPA registration and strong performance in peer-reviewed, scientific studies. They reflect products currently available in the U.S.

ON CLOTHING AND GEAR

Permethrin

Permethrin treatment of clothing and equipment can provide protection against mosquitoes and ticks through multiple washings. Follow label instructions.

