

State of Vermont

Arbovirus Surveillance and Response Plan

Revised July 2019



VERMONT

**AGENCY OF AGRICULTURE, FOOD & MARKETS
DEPARTMENT OF HEALTH**

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Introduction to the 2019 Revision

The 2019 Vermont Arbovirus Surveillance Plan is based on the Centers for Disease Control and Prevention (CDC)'s *West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control*. This plan was originally created in 2003 and has been reviewed and updated periodically.

The current Plan is a revised version of the 2017 plan, which focused on responding to Eastern equine encephalitis virus (EEEV) and providing information on West Nile virus (WNV). The 2019 revision outlines arboviral education, surveillance, and guidance for the state's response to a positive EEEV or WNV finding.

This plan is based on the most up-to-date scientific information available and incorporates guidelines from the CDC and the recommendations of the Vermont Agency of Agriculture, Food & Markets (VAAF) and the Vermont Department of Health (VDH). Knowledge gained from subsequent surveillance and research data, both nationally and in Vermont, may result in further revisions to this plan.

This current version has been reviewed by the State Epidemiologist for Infectious Disease, State Public Health Veterinarian, State Entomologist, and State Veterinarian.

Background Information on Eastern Equine Encephalitis Virus

Eastern equine encephalitis virus (EEEV) is a member of the genus *Alphavirus*, family *Togaviridae*. The virus is maintained in nature through avian hosts and *Culiseta melanura* mosquitoes located primarily in freshwater, hardwood swamps. *Culiseta melanura* mosquitoes mostly bite birds, and it is not known if it is an important vector for human infection. Mosquito species that bite both birds and mammals are considered "bridge" vectors and may be the route of transmission of EEEV to mammals. Mosquito species from the genera *Aedes*, *Ochlerotatus*, *Coquillettidia*, and *Culex* are all potential bridge vectors.

In humans, an infection with EEEV can vary from asymptomatic to severe illness. People who become ill with an EEEV infection either have systemic or encephalitic disease. Symptoms of a systemic illness include the abrupt onset of fever, chills, fatigue, arthralgia, and myalgia, which lasts 1–2 weeks. Those with encephalitic disease may have fever, headache, irritability, vomiting, diarrhea, convulsions, and other symptoms. Approximately one-third of all people with EEEV die from the disease. About half of people who survive have some degree of permanent neurologic damage.

EEEV infection causes a severe neurologic disease in horses and other equids. Mortality in unvaccinated horses approaches 90%. Signs and symptoms in horses include fever, depression, anorexia, ataxia, limb weakness or paralysis, blindness, irritability, and sudden death. EEEV can also cause serious illness in emus and other ratites, and signs of hemorrhagic gastroenteritis predominate. Alpacas and llamas are also susceptible to EEEV.

The virus is well established in North America, and outbreaks in horses were recorded as

early as 1831. Human cases are relatively uncommon, with an annual average of seven cases reported nationally between 2008 and 2017 (range, 3–15). Most EEEV activity has occurred in the Atlantic and Gulf Coast states, and most human cases were reported in Florida, Georgia, New Jersey, and Massachusetts.

The first evidence of EEEV in Vermont was obtained in a 2010 deer and moose serosurvey. Approximately 10% of the deer and moose sampled had evidence of prior exposure to EEEV. These seropositive cervids were distributed widely throughout the state, with no evidence of clustering in particular regions.

In 2011, EEEV was first detected through veterinary surveillance in Vermont when an emu in Rutland County tested positive for the disease. The following year had the highest EEEV activity in Vermont. Ten mosquito pools – groups of up to 50 mosquitos of the same species – from Addison and Rutland counties tested positive for the virus during July–September of 2012. Two horses from these counties also tested positive for EEEV and two residents of Rutland County died of the disease.

2013 again had increased EEEV activity, with 21 mosquito pools testing positive in Addison and Rutland counties. One positive pool was detected in Chittenden County and two horses tested positive for EEEV in Franklin county, the state’s first EEEV identifications outside Rutland and Addison Counties. Eight mosquito pools tested positive for EEEV in 2014, followed by one positive pool in 2015. No EEEV-positive pools were detected in 2016, 2017, and 2018.

Information collected in Vermont indicates that EEEV activity is clustered near acidic, hardwood swamps – the most activity occurring in Addison and northern Rutland counties. This area will be considered higher risk for the foreseeable future. Given the diagnosis of EEEV infection in horses in Franklin County in 2013, as well as the positive mosquito pools detected in this county in 2014 and 2015, this area is also considered to be higher risk.

Results of the 2010 deer and moose serosurvey indicated that cervids from many different parts of the state are being exposed to the virus. While it is not yet understood if this has any significance for the risk for human illness, it is possible other high-risk foci may be identified in the future.

Eastern Equine Encephalitis Virus Identifications — Vermont, 2011–2018			
Year	Veterinary	Mosquito Pools	Humans
2011	1	0	0
2012	2	10	2
2013	2	23	0
2014	0	8	0

2015	0	1	0
2016	0	0	0
2017	0	0	0
2018	0	0	0

Background Information on West Nile Virus

West Nile virus (WNV) is a Flavivirus from the family *Flaviviridae* that can infect a wide range of vertebrates, birds being the natural reservoir hosts. WNV is maintained in nature in a mosquito–bird transmission cycle primarily involving *Culex* mosquitoes, particularly *Culex pipiens*, *Culex restuans*, and *Culex quinquefasciatus*. Many species of birds commonly survive their infections and develop permanent immunity; the amount of virus can even become amplified in some bird species. However, several other species become ill and die, particularly corvids such as crows, blue jays, and ravens.

The majority (approximately 80%) of humans infected with WNV experience no symptoms. Approximately 20% of those infected develop a febrile illness. Less than one percent of those infected with WNV develop severe neurologic illness, such as encephalitis or meningitis, which can be fatal in a small percentage of cases. People over 50 years of age and those who have weakened immune systems are at greatest risk for severe illness caused by WNV infection.

Like humans, horses infected with WNV can experience asymptomatic infection or illness that can be mild or severe. Approximately one third of horses that develop severe illness die or are euthanized. However, the availability of a WNV vaccine for horses has greatly reduced the number of equine cases.

West Nile virus was first detected in the United States in 1999 after being imported from overseas. Since then it has become the most commonly reported arboviral disease in the country. The virus was first detected in Vermont in 2000 and has spread to all 14 counties. WNV is considered enzootic and widespread in the state and no part of the state appears to be at greater risk than others. Active mosquito-based WNV surveillance is conducted June through October every year throughout Vermont, and passive veterinary and human surveillance is conducted year-round. Surveillance for WNV through the testing of dead birds ended in 2011.

West Nile Virus Identifications — Vermont, 2000–2018				
Year	Veterinary	Birds	Mosquito Pools	Humans
2000	0	1	0	0
2001	0	0	0	0

2002	5	125	11	1
2003	4	116	0	3
2004	0	9	7	0
2005	2	4	2	0
2006	0	9	0	0
2007	0	3	0	0
2008	0	1	1	0
2009	0	4	12	0
2010	0	1	9	0
2011	0	16	3	1
2012	2	N/A	1	3
2013	1	N/A	28	2
2014	0	N/A	8	0
2015	0	N/A	96	0
2016	0	N/A	19	2
2017	0	N/A	89	3
2018	2	N/A	157	1

Plan of Action

Information gathered from surveillance activities informs local policymakers about the level of arboviral activity and the potential threat to human and animal health. This plan allows the state and local government the flexibility to respond to local conditions. The goal of the State of Vermont Arbovirus Surveillance and Response Plan is to protect public health from an outbreak of WNV or EEEV. To accomplish this goal, emphasis is placed on public education about the transmission of these viruses, reduction of mosquito breeding habitats (e.g. water-collecting containers, tarps, tires, etc.), and personal protective measures to prevent or reduce the risk of exposure.

Widespread adult mosquito suppression programs will only be considered as a last resort if surveillance data suggest an increasing and significant risk to human health. Decisions for public health action will be informed by interpretation of available surveillance data and several additional factors, including:

- Current weather;
- Time of year (i.e., how long the transmission risk can be expected to persist until mosquito activity decreases);
- Feasibility of mosquito suppression activities;
- Public input on planned response activities;
- Ecology of the area (e.g., key habitat types);
- The human population at risk (urban versus rural; consideration of the relative risk of pesticide use versus arbovirus infection); and
- Vector species known or believed to be of importance in the area.

The anticipated benefits of using pesticides versus the risk for harm to people and the environment from their use, as well as the factors listed previously, will be considered. If the use of pesticides to control arboviruses is anticipated, steps will be taken to inform the local community and address public concerns.

Components of the Plan

A. Education

Education of healthcare providers, veterinarians, and the public about arboviral illnesses is a key focus of this plan. Each spring and early summer educational materials will be updated and distributed as appropriate, including news releases, VT-Health Alert Network (HAN) notifications, information on the Health Department’s website, emails, and other methods. Additional educational efforts may be made in response to positive surveillance indicators.

Activity	VDH	VAAF
Maintain educational messages with emphasis on personal protective measures for groups at highest risk for serious illness (e.g., individuals over 50 years of age) and on the importance of reducing artificial mosquito breeding sites.	✓	✓
Update the Department of Health’s WNV and EEEV web pages as indicated.	✓	
Communicate information to the public as needed, including: <ul style="list-style-type: none"> • minimizing exposure to arbovirus vectors • the importance of public cooperation in reducing mosquito breeding sites • integrated pest management for controlling mosquito 		✓

populations <ul style="list-style-type: none"> • preventing mosquito bites • the agencies responsible for mosquito suppression activities • how to protect susceptible animals from illness 		
Respond to public inquiries.	✓	✓
Educate healthcare providers about testing and reporting of arboviral diseases in humans.	✓	
Educate veterinarians about testing and reporting of arboviral diseases in animals.	✓	✓

B. Passive Human Surveillance

Active surveillance for human cases will be considered if surveillance data indicate an increased risk for human illness.

Activity	VDH	VAAF
Disseminate information about arbovirus surveillance to healthcare providers around the state.	✓	
Maintain surveillance data on reported human cases.	✓	
Provide information on the number of human cases to the public and local officials.	✓	
Report human cases to the CDC.	✓	
Coordinate testing of specimens for arboviruses as appropriate. This includes coordinating submission of serologic samples from commercial or clinical labs for confirmatory testing at a public health laboratory.*	✓	

*Hospitalized patients who have encephalitis or meningitis of suspected viral origin or Guillain-Barré syndrome should be evaluated for arboviral infection. Patients meeting these criteria may be tested through the Vermont Department of Health Laboratory (VDHL).

VDHL will not provide testing for persons who have milder illness, such as fever or headache. Testing may be pursued by healthcare providers through commercial laboratories.

Specimens submitted to VDHL should be accompanied by a completed Clinical Test Request Form (Micro 220). Date of onset must be included.

All positive IgM test results should be confirmed by neutralizing antibody testing of acute- and convalescent-phase serum specimens at CDC or other public health laboratory.

C. Passive Veterinary Surveillance

Activity	VDH	VAAF
Disseminate information on veterinary surveillance activities to veterinarians throughout the state.	✓	✓
Facilitate testing of suspect veterinary cases.	✓	✓
Maintain surveillance data on arbovirus-infected domestic animals in Vermont.	✓	✓
Provide veterinary surveillance data to the public and local officials.	✓	✓
Report veterinary surveillance data to the CDC via ArboNET.	✓	
Encourage veterinarians to speak to their clients about the importance of arboviral vaccination programs.		✓

D. Adult Mosquito Surveillance

Monitoring mosquitoes consistently provides information about the species present and seasonal population trends. Each year, adult mosquito surveillance begins in mid-June before the expected start of arbovirus season in July. Surveillance ends in mid-October unless extended surveillance is indicated due to warm air temperatures or evidence of EEEV presence.

Areas targeted for mosquito surveillance are selected based on perceived risk (e.g., more densely populated areas, known flooding tendencies), suitable habitat, geographic location, and accessibility.

A combination of carbon dioxide-baited CDC light traps, gravid traps, and resting boxes are used to collect mosquitoes. Resting boxes are used to target EEEV-competent species.

Carbon dioxide-baited CDC light traps primarily collect host-seeking, non-blooded female mosquitoes and are used and serviced as resources permit. Traps are set in the late afternoon or early evening, retrieved the following morning, and operated consistently at productive sites.

Gravid traps are designed to collect mosquitoes seeking oviposition (egg-laying) sites. Following blood feeding, female mosquitoes seek sheltered areas to rest and digest the blood meal into eggs. Once eggs have formed, the gravid female seeks a site to lay her eggs. Gravid traps target these sites and are set in the late afternoon or early evening and retrieved the following morning.

Resting box traps are set in areas conducive to surveying for the primary vector species for EEEV, *Culiseta melanura*. Ground surveys may also be used to detect resting populations. Live specimens are collected from resting areas and used to determine

population densities. Both natural resting sites (bridges, porches, culverts, vegetation) and artificial (red boxes, black boxes, nail-keg shelters) may be used for this purpose.

Activity	VDH	VAAFMM
Determine favorable sites for mosquito collection depending on target species.		✓
Identify female mosquitoes to species and separate into pools – groups of 1 to 50 mosquitoes of the same species trapped at the same location on the same night.		✓
Sort and submit mosquito pools of appropriate species for WNV and EEEV testing at VDHL. <ul style="list-style-type: none"> • To detect EEEV, prioritize <i>Culiseta melanura</i> and other <i>Culiseta</i> spp. Other suspected bridge vectors may also be tested, including <i>Aedes</i> spp., <i>Ochlerotatus</i> spp., and <i>Coquilleltidia perturbans</i>. • To detect WNV, prioritize trapping and testing of <i>Culex</i> spp. (e.g., <i>C. pipiens</i>, <i>C. restuans</i>, <i>C. salinarius</i>) and suspected secondary vectors of the genus <i>Aedes</i> and <i>Ochlerotatus</i> (e.g., <i>A. japonicus</i>, <i>O. triseriatus</i>, <i>A. trivittatus</i>, <i>A. canadensis</i>, and <i>A. vexans</i>). 		✓
Test pools submitted by VAAFMM Vector Surveillance for WNV and EEEV via polymerase chain reaction (PCR).	✓	
Store mosquito pools that were not submitted in case viral testing is later indicated.		✓
Maintain records of mosquito trap sites, the number and species of mosquitoes collected by location and date, and arbovirus test results.		✓
Coordinate insecticide resistance testing of adult mosquitoes and report results to CDC via MosquitoNET.		✓
Summarize mosquito surveillance data and report to the public and local officials.		✓
Summarize and report mosquito-based arboviral surveillance data to the public and local officials. See response section for more details.	✓	
Report mosquito surveillance data to the CDC via ArboNET and MosquitoNET.		✓

Conduct enhanced mosquito surveillance in areas where EEEV has been detected in a human or domestic animal.		✓
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E. Larval Mosquito Surveillance

Surveillance activities for immature mosquitoes (larvae and pupae) involve the mapping and characterization of aquatic habitats where mosquitoes breed. Mosquito breeding can occur anywhere there is standing water. Examples include tires, pails, garbage cans, planters, rain gutters, bird baths, storm drains, unchlorinated swimming pools, swimming pool covers, tarps, and puddles. Mosquito breeding can also occur in natural water-filled areas, such as wetlands, temporarily flooded areas, or stream edges.

Larval mosquito surveillance is generally conducted in towns participating in the Mosquito Control District program, where larval data inform mosquito control and outreach activities.

Activity	VDH	VAAFM
Map and characterize aquatic mosquito breeding habitats.		✓
Sample mosquito larvae using standard dipping techniques.		✓
Identify larvae to species using larval mosquito identification keys.		✓
Maintain records of the number and species of larvae sampled by location and date. Samples will be recorded as the number of larvae per dip on the Mosquito Breeding Site Survey Form.		✓

F. Response

The key to reducing the risk for EEEV and WNV infection is educating the public about measures they can take to protect themselves against mosquitoes.

Risk Assessment

A risk assessment and response matrix has been developed to help guide the response to EEEV surveillance indicators (Attachment 1). The risk assessment should be considered a general guide and does not provide certainty of the degree of risk. Predicting the likelihood of human illness has been difficult even in states that have more surveillance data than Vermont.

Mosquito surveillance provides the most useful information for risk assessment. Therefore, the EEEV Risk Assessment Response Matrix is best applied in areas where active adult mosquito surveillance is occurring. Risk is assigned to an area based on the prior two years of surveillance data, with modifications made as results from the current year are available.

It is difficult to determine an area's risk level given a positive surveillance finding. There

is some evidence that most human illness occurs in people who live within five miles of a hardwood acidic swamp. Therefore, an area of approximately five miles around positive mosquito pools are designated as “potentially at risk.”

Because it cannot be determined with certainty that people further away than five miles are not at risk, an additional five-mile area “of concern” is added to the area “potentially at risk.” If veterinary or human cases are detected, additional risk areas may be designated depending on the likely place of exposure. Geographic features are considered, such as the Green Mountains, which could affect the potential flight range of infected mosquitoes. Identified risk areas are represented on a map and updated as indicated throughout the arbovirus season and posted on the VDH website.

Areas of the state that do not have any mosquito surveillance should be considered at “remote” risk. Nonetheless, residents of those areas should take precautions to prevent mosquito bites and reduce mosquito breeding sites in their communities. The risk for WNV infection is statewide. The extent of the risk for EEEV infection is not as well understood.

In most cases, response to EEEV and WNV surveillance indicators are educational and include information on preventing mosquito bites, reducing peridomestic exposure, seeking appropriate medical care, and protecting susceptible animals. Increased surveillance may also be recommended for EEEV surveillance indicators. Vector management to suppress mosquito populations may be considered if the risk for human EEEV infection appears to be high.

In general, response to a detection of arboviral activity include the following:

Notification and communication in response to detection of WNV or EEEV

Activity	VDH	VAAF
First positive indicator		
Issue a statewide press release in response to the first positive indicator of the season.	✓	
Positive mosquito		
At a minimum, notify the VDH District Office and the Town Health Officer. Provide standard educational outreach templates for publication in social media or local newsletters.	✓	
Consider additional press releases if there is an increased risk to human and animal health. This depends on the pathogen identified, species of mosquito found to be positive (i.e., bird-biter vs mammal-biter), mosquito infection rate, and total positive surveillance indicators.	✓	

Domestic animal arboviral infection		
Notify State Veterinarian, who notifies the attending veterinarian and the veterinary community, if indicated.	✓	✓
Notify Town Health Officer, local District Office, and the Communications Offices of both VDH and VAAFM.	✓	
Consider active surveillance for additional veterinary cases.	✓	✓
Consider enhanced mosquito surveillance in the area of likely exposure to EEEV.	✓	✓
Human arboviral infection		
Notify the Commissioner of Health, the Communications offices of VDH and VAAFM, and the local District Office. To preserve patient confidentiality, the Town Health Officer is not notified.	✓	
Consider a press release or a Health Alert reminding physicians to consider arboviral infection in their patients with compatible illness.	✓	
Consider enhanced mosquito surveillance (for EEEV only) and enhanced passive or active human surveillance.	✓	✓

Vector Management

Larval source reduction in defined areas (usually peridomestic) is the most effective way to prevent transmission of WNV. The efficacy of larviciding to prevent EEEV is less clear. Adulticiding may be indicated if large numbers of EEEV-infected adult mosquitoes are present, and will be considered on a case-by-case basis. If adulticiding is indicated, the State will consult the Multi-agency Aerial Adulticide Application Plan (Attachment 2) and do the following:

Activity	VDH	VAAFM
Consult with local officials regarding a mosquito suppression project.	✓	✓
Assist local officials in conducting informational meetings on proposed mosquito suppression programs. Make public notice at least 24 hours prior to any state-ordered ground-level or aerial spraying of adulticides.	✓	✓
Secure all permits necessary to conduct the appropriate mosquito		✓

suppression program.		
Notify the State Apiculturist of planned adulticiding activities. State Apiculturist will notify beekeepers in the area, directly or indirectly, to the extent possible based on available contact information.		✓
Notify the Vermont chapter of the Northeast Organic Farming Association of Vermont.		✓
Notify local healthcare providers, poison control center, and USDA Vermont Rabies Hotline.	✓	
Notify the Commissioner of the Vermont Department of Fish & Wildlife.		✓
Notify veterinarians and livestock owners and producers using communication channels such as the Vermont Veterinary Medical Association Newsletter, VAAFAM Animal Health Newsletter, and other pertinent e-mail distribution lists.		✓
Secure pesticide(s), aerial applicator, and ground-based ULV machinery and enlist certified pesticide applicators to conduct mosquito suppression programs.		✓
Assemble a ground monitoring crew to handle environmental issues (e.g., weather, water, wildlife, livestock, non-target and ecosystem effects, organic farms and other crop lands).		✓
Apply mosquito larvicide or adulticide.		✓
<p>Implement surveillance for possible human health effects of exposure to pesticides by collecting reports from poison control and local emergency departments. This information will be used to identify:</p> <ul style="list-style-type: none"> • Serious, unusual, or repeated acute health effects that show a pattern of association with local or aerial spraying that might warrant further evaluation. More intensive evaluation might include collection of detailed case histories for a subset of reports or review of emergency department records. • Unexpected routes of pesticide exposure that might warrant investigation. • Frequent problems in responding to concerns and inquiries about pesticide health effects, including knowledge gaps. 	✓	

Attachment 1. EEE Estimated Risk Assessment and Response Matrix

Risk Category	Definition of Risk Category	Recommended Response	State Response	Local Response
Remote	<p>Prior 10 Years:</p> <ul style="list-style-type: none"> • No human or veterinary cases reported, and • No EEE virus detected in mosquitoes <p>AND</p> <p>Current Year:</p> <ul style="list-style-type: none"> • No human or veterinary cases reported, and • No EEE virus detected in mosquitoes 	<p>Public:</p> <ul style="list-style-type: none"> • Use EPA-registered mosquito repellents • Wear long sleeves and long pants • Repair screens • Remove standing water <p>State agencies/town officials:</p> <ul style="list-style-type: none"> • Disseminate information about personal protection and source reduction • Conduct routine human, mosquito, and veterinary surveillance statewide 	<ul style="list-style-type: none"> • Distribute general prevention messages to the public statewide: VAAFMT Animal Health creates animal health messages and VDH‡ creates human health messages • VAAFMT and VDH distribute public health messages, including emails to town officials, VDH District offices, and other state agencies 	<ul style="list-style-type: none"> • Town officials help distribute prevention messages, including posting informational flyers in public places and information on the town website and public forum websites (e.g., Front Porch Forum)

† Vermont Agency of Agriculture, Food & Markets

‡ Vermont Department of Health

Risk Category	Definition of Risk Category	Recommended Response	State Response	Local Response
Low	<p>Prior 10 Years:</p> <ul style="list-style-type: none"> • Human or veterinary cases of EEE or EEE virus detected in mosquitoes <p>OR</p> <p>Current Year:</p> <ul style="list-style-type: none"> • EEE virus detected in bird-biting mosquitoes at a single trapping site, and • No human or veterinary cases 	<p>State agencies/town officials:</p> <ul style="list-style-type: none"> • Focus public education efforts on risk potential, personal protection, and source reduction to at-risk communities[§] • If indicated by entomologic data, use larvicides to target vector species; consider source reduction techniques • If EEE virus detection(s) in current year, consider adulticiding** based on current regional epidemiology and surveillance efforts • Consider supplemental trapping and testing of mosquitoes near EEE virus detection(s) 	<p>Previous category response AND:</p> <ul style="list-style-type: none"> • Distribute prevention messages to the public in at-risk communities: VAAFM Animal Health creates animal health messages and VDH creates human health messages • VAAFM continues adult mosquito surveillance; considers expansion of mosquito surveillance as needed 	<p>Previous category response AND:</p> <ul style="list-style-type: none"> • Town officials in targeted communities disseminate educational messages • Town/local mosquito control district continues larval surveillance and control; increase source reduction if needed; continue existing adulticiding program; consider applying adulticide around area of EEE-positive trap site if location is close to population center

§ For the purposes of this risk assessment, at-risk communities include the area within 5 miles of a location where EEE virus activity was detected. Because the risk may not be limited to a 5-mile radius, the area between 5 and 10 miles from the location of the EEE activity will be designated as an “area of concern.” Areas designated to be at-risk or of concern may be modified if geography would likely mitigate the risk (e.g. Green Mountains).

** The decision to initiate adult mosquito control will depend on the time of year, mosquito population abundance, and proximity of virus activity to at-risk populations. The ability to respond by ground spraying depends on the network of available roads. In many Vermont communities, the density of roads may be insufficient for ground-based application of adulticide to be effective at reducing human risk for illness. To maximize effectiveness, adulticide treatment should be applied twice within 7 days.

Risk Category	Definition of Risk Category	Recommended Response	State Response	Local Response
Moderate	<p>Prior 2 Years:</p> <ul style="list-style-type: none"> • Confirmation of human or veterinary case(s) <p>OR</p> <p>Current Year:</p> <ul style="list-style-type: none"> • Sustained (2 or more weeks) EEE virus identifications in bird-biting mosquitoes at one trap site, or • EEE virus identifications in bird-biting mosquitoes collected from multiple trap sites within a community, or • EEE virus detected in bridge vector at any single trap site 	<p>State agencies/town officials:</p> <ul style="list-style-type: none"> • If indicated by entomologic data, increase larval control, source reduction, and public education, emphasizing personal protection measures • If current year activity, consider larviciding and adulticiding targeting likely vector species • Consider personal protection measure outreach targeting high-risk populations (e.g. long-term care facilities [LTCFs], schools, camps) 	<p>Previous category response AND:</p> <ul style="list-style-type: none"> • VDH creates and disseminates prevention messages for high-risk populations via District Offices, targeting institutions that service at-risk populations • If current year activity is detected, VDH, VAAF, and town officials decide whether application of adulticide is necessary and determine the extent and best method of treatment • If application of adulticide is necessary, VAAF determines which pesticide to use and hires contractor to apply the adulticide; VDH and VAAF alert the public of date(s) and time(s) of application and recommended precautions • VDH considers declaration of a public health risk 	<p>Previous category response AND:</p> <ul style="list-style-type: none"> • Town/local mosquito control district considers intensifying larviciding for secondary vector species and ground application of adulticide • Town officials continue to disseminate educational messages in targeted communities • Town officials should confer with State on necessity of applying adulticide • If application of adulticide is necessary, town officials should work with the State to alert their residents about the date(s) and time(s) of application

Risk Category	Definition of Risk Category	Recommended Response	State Response	Local Response
High	<p>Current Year:</p> <ul style="list-style-type: none"> • Confirmed human or veterinary case(s), or • Sustained (2 or more weeks) EEE virus identifications in bridge vector at a single trap site, or • EEE virus detections in bridge vector collected from multiple trap sites within a community 	<p>Public:</p> <ul style="list-style-type: none"> • Avoid areas where mosquitoes are very active • Adjust outdoor activity to avoid peak mosquito hours (dusk until dawn) <p>State agencies/town officials:</p> <ul style="list-style-type: none"> • Intensify public education efforts about personal protection using multimedia messaging • Actively educate high-risk populations (e.g. LTCFs, schools, camps) on personal protection measures • Initiate trapping and testing of vector species in likely exposure area(s) of human and veterinary cases, if not already being done • Consider intensifying larviciding and/or adulticiding as indicated by surveillance • If the risk for human illness appears to be ongoing or increasing, intensified ground-based or targeted aerial adulticiding may be recommended 	<p>Previous category response AND:</p> <ul style="list-style-type: none"> • VDH creates and disseminates prevention messages, including the recommendation to curtail outdoor activities from dusk to dawn • VAAFMM considers adding mosquito traps around positive surveillance indicators if not already present • VDH and VAAFMM determine if aerial spraying is warranted and the extent of aerial spraying • If application of adulticide is necessary, VAAFMM determines which pesticide to use and hires contractor to apply the adulticide • VDH considers declaration of a public health risk, if not already declared 	<p>Previous category response AND:</p> <ul style="list-style-type: none"> • Town officials work with institutions in community to decide whether evening activities should be curtailed • Town officials continue to disseminate educational messages in targeted communities • Town/local mosquito control district considers intensifying ground-based adulticide application around positive indicators and nearby population centers • If application of adulticide is necessary, town officials work with the State to alert their residents about the date(s) and time(s) of application

Attachment 2. Multi-agency Aerial Adulticide Application Plan

1. Determination of Response

When human risk is elevated to a high level of concern as indicated by the Vermont Arbovirus Surveillance and Response Plan, VDH^{††} determines, in consultation with VAAFM^{‡‡}, whether aerial application is warranted.

2. Characterization of Area of Risk

Once consensus is obtained, VDH and VAAFM characterize the area(s) of risk and delineate the perimeter of the spray area based on mosquito and virus surveillance.

3. Commissioner Certification

The Commissioner of Health issues a “Determination of Significant Public Health Risk Requiring Aerial Application of Pesticide to Protect Public Health.”

(Action items 4-6 occur simultaneously.)

4. Determination of Appropriate Pesticide

VAAFM consults with the Vermont Pesticide Advisory Committee (VPAC) to determine the pesticide to be used and confirms selected pesticide for use.

5. Determination of No-Spray Zones

Aerial no-spray zones (mosquito treatment sensitive areas data layers):

- Certified organic farms
- Surface water supply resource areas
- Commercial fish hatcheries/aquaculture
- Commercial apiaries

VAAFM/VDH submits a ‘Notice of Intent’ to the Vermont Department of Environmental Conservation to obtain National Pollutant Discharge Elimination System pesticide general permit (NPDES PGP) coverage within 10 days of the aerial adulticide application, if there is no current valid permit.

6. Exclusion/Inclusion of Priority Habitats

VDH determines, in consultation with VAAFM, if spraying in mosquito treatment sensitive areas is necessary to protect the public health.

^{††} Vermont Department of Health

^{‡‡} Vermont Agency of Agriculture, Food & Markets

If necessary, then VDH requests ANR§§ to issue a permit to VAAFM for taking endangered, threatened, or special concern species.

7. Preparation of Final GIS Data

VAAFM coordinates mapping of mosquito treatment sensitive areas within designated VDH spray areas, using data layers (no-spray zones/buffered areas) chosen by VAAFM and the Northeast Organic Farming Association.

8. Emergency Room and Poison Control Contacts

VDH contacts and provides pesticide illness surveillance guidance to emergency departments, poison control centers, and District Offices.

9. Notification of Date and Time of Application

VAAFM and VDH publicizes the locations, dates, and times of aerial spraying. VAAFM posts a map of the aerial spray area to a website and updates this site during spray operations. VDH provides telephone number(s) for public inquiries.

10. Operational Procedures-Aerial Application

VAAFM ensures that contractors are licensed and experienced and that the aerial application operational procedures comply with Vermont Aviation and FAA guidelines and standards.

§§ Vermont Agency of Natural Resources