



# Town of Plaistow

## Arboviral Illness

### Surveillance, Prevention and Response Plan

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## INTRODUCTION

The Plaistow Arboviral Illness Surveillance, Prevention and Response plan provides surveillance and phased response guidance for mosquito-borne arboviruses, specifically West Nile virus (WNV) and Eastern Equine Encephalitis (EEE) virus. The plan will illustrate the operational aspects of surveillance, prevention and response and is designed to incorporate proactive community planning and actions to reduce the risk of human disease from EEE virus and WNV.

## I. DISEASE BACKGROUND

The two main mosquito-borne viruses (also known as arboviruses, for **arthropod-borne** viruses) recognized in New Hampshire and known to cause human and animal disease are Eastern Equine Encephalitis (EEE) virus with the first recent NH human case identified in 2004; and West Nile virus (WNV) with the first human cases in 2003. In 2013, the first case of locally acquired Jamestown Canyon virus (JCV) was identified in NH.

### A. Eastern Equine Encephalitis Virus

EEE virus is an alphavirus, present in many perching song bird species found in fresh-water swamp habitats. The virus is transmitted among wild birds in these areas primarily by *Culiseta melanura*, a mosquito species that feeds almost exclusively on birds. EEE virus has a cycle of natural infection among wild bird populations with occasional infections of humans, non-human mammals (most often horses) and large domesticated birds (emus, ostriches, etc.). Infected mammals (e.g., humans, horses) do not serve to spread the virus since mosquitoes biting infected mammals do not become infected. Risk of infection in humans is a function of exposure to infectious human-biting mosquitoes. These bridge vectors (i.e., a mosquito species that is indiscriminant and will feed on birds or humans) are responsible for transferring the EEE virus to humans.

Many people infected with EEE will not have symptoms of the disease, while others may get only a mild flu-like illness with fever and headache. However, for people with infection of the central nervous system, a sudden high fever, severe headache, and stiff neck can be followed quickly by seizures, coma, and death. *The cost of a single human case of EEE has been estimated to range from \$21,000 for mild, transient illness, to as much as \$3 million for individuals who suffer permanent neurological damage.*

The incidence of EEE infection in humans varies by geographical area. Human EEE disease is more common in areas that support dense populations of perching song birds and have favorable larval habitats for the primary mosquito vector. In New Hampshire, these areas consist mainly of large and mature white cedar and red maple swamps. The majority of EEE human cases in NH have occurred in Rockingham County with cases also occurring Merrimack, Hillsborough and Carroll counties.

Additionally, the likelihood of mosquito exposure is a key factor in determining the risk of human EEE infection. The abundance of specific species of mosquitoes at critical periods during the transmission season, in part determined by groundwater levels and the timing of rainfall during the mosquito season, is important in determining the likelihood of mosquito exposure. The use of personal protective measures (avoidance of mosquitoes, use of repellent, etc.) by people reduces their risk of exposure and infection.

## **B. West Nile Virus**

WNV is a flavivirus. Like EEE, WNV is also maintained in the environment in a cycle that involves birds, with indiscriminate feeding mosquitoes infecting humans and other mammals. WNV causes sporadic disease in humans, and occasionally results in significant outbreaks.

While symptoms may vary, about one in 150 people infected with WNV will develop severe illness (WNV neuroinvasive disease). Severe symptoms can include high fever, headache, neck stiffness, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, and paralysis. These symptoms may last several weeks, and neurological effects may be permanent. Up to 20 percent of the people who become infected will display symptoms of WNV fever, including fever, headache, body aches, and sometimes swollen lymph glands. Symptoms can last for days to months. People over 50 years of age are at a higher risk of developing serious symptoms of WNV.

WNV activity varies from year to year. When there are a high proportion of infected mosquitoes in a relatively small geographic area, the risk of transmission of virus to humans will increase.

## **C. Jamestown Canyon Virus**

JCV is a bunyavirus and circulates in nature in a cycle including deer and various mosquito vectors. The transmission cycle of JCV is still being described, but it is thought that early season mosquitoes such as *Ochlerotatus* species, play a significant role in transmission of this virus. This species overwinters as eggs and may be infected when they are laid in the fall by an infected female mosquito. When the eggs hatch after the snow melts in the Spring, they will be able to transmit the virus when they take their first blood meal. Reports of human illness are rare, although JCV is known to be widely distributed throughout North America. It is thought that many people infected with JCV do not develop any illness. Typically, JCV will cause a mild, feverish illness, although meningitis and encephalitis have been reported. It is not known how JCV activity varies through the bite of an infected mosquito, the use of personal protective measures (avoidance of mosquitoes, use of repellent) can reduce risk of exposure and infection.

## **II. PROGRAM GOALS**

Timely and accurate information may offer an early warning of increased risk of WNV and EEE virus infection of humans and non-human mammals. Based on surveillance information, actions to reduce risk can be implemented when needed.

## Specific Program Priorities

1. Provide expertise in proactively minimizing the risk to Plaistow citizens and visitors of being exposed to and infected with mosquito-borne diseases.
2. Gain guidance from NH DHHS and the NH Arboviral Illness Task Force created through Chapter 284, Laws of 2006 to enhance local mosquito-borne disease surveillance and control.
3. Providing assistance to contracted mosquito- control company in identifying potential breeding sites for mosquitoes.
4. Submit mosquitoes for testing to identify EEE virus and WNV.
5. Recommending measures to reduce disease transmission.
6. Providing information to the public on mosquito-borne diseases and disease risk, and how to take precautions to reduce the risk of infection.

The Town of Plaistow works cooperatively with NH DHHS, other state agencies, area communities, and school district officials to identify and support the use of risk reduction and disease prevention methods that are specific to the cause of the diseases, that use the least intrusive and most appropriate prevention methods, and that support planning and practices that reduce the use of pesticides.

### **III. PREVENTION AND CONTROL**

Ultimately, the key to reducing the risk of arboviral disease is education and outreach to the public regarding the need for mosquito-bite prevention and explaining how they can protect themselves from diseases such as EEE and WNV. The emergent public health threat posed by arbovirus illness requires a vigilant outreach effort. As the local public health entity, the Plaistow Health Department will continue to take a lead role in providing public education efforts to promote prevention, working with our partners to maximize the opportunity to make our citizens aware of the dangers posed by mosquito-borne illness. This will include working with the media, area communities, businesses and special populations, such as schools, the homeless and others who spend considerable amounts of time outdoors, such as those that hunt, fish or attend or participate in outdoor activities.

Individuals can take a number of simple steps that will greatly reduce the risk of mosquito-borne viruses to them, their families, and their communities. Choosing to wear protective clothing (e.g., long pants, long-sleeve shirts, and socks), using effective mosquito repellants, and minimizing opportunities for certain mosquitoes to breed are all important ways individuals can prevent the spread of WNV and EEE in New Hampshire. Community efforts, such as public education, mosquito surveillance, and chemical control aimed at mosquito larvae (larviciding) and adult mosquitoes (adulticiding) may be necessary to decrease the local risk of EEE virus and WNV.

#### **A. Prevention Through Knowledge**

The goal of all mosquito-borne virus public information activities is to provide helpful, accurate and specific advice and information to the citizens of Plaistow, so they can approach this

problem with the appropriate level of caution. Information on the following topics has been distributed in print, through various websites and through local media and town activities:

- ✓ Eastern Equine Encephalitis general information
- ✓ West Nile Virus general information
- ✓ Preventing mosquito breeding opportunities
- ✓ Health risks to humans and domestic animals from arboviral illnesses
- ✓ Personal protection from mosquitoes
- ✓ Special Information for schools, camps and daycare facilities
- ✓ Special information for the homeless population
- ✓ How to minimize mosquito breeding opportunities around the home and businesses
- ✓ Outdoor activities during mosquito season
- ✓ Testing results from the State of NH
- ✓ Public Health Advisories

**1. Printed Materials:** Fact sheets and information on the above topics are available at the Town Hall and on the Health page of the town website at ([www.plaistow.com](http://www.plaistow.com)) and the DHHS Mosquito- borne diseases website ([www.dhhs.nh.gov/dphs/cdcs/arboviral/index.htm](http://www.dhhs.nh.gov/dphs/cdcs/arboviral/index.htm)). Educational materials developed by other State and Federal agencies are also available on this site. Fact sheets and other printed materials are developed and amended as new information warrants.

**2. WNV & EEE Website:** The Health page of the Town of Plaistow website, [www.plaistow.com](http://www.plaistow.com) serves as a central source for current, accurate, WNV and EEE information. Information on the site includes general information, updated testing information, public notices, public health advisories, and local mosquito control activities and findings. Links to other informational websites and state and federal agency sites are included.

**3. Community Outreach:** Prior to and during the surveillance season, the Plaistow Health Department distributes educational materials throughout the community. This includes the following:

- Laminated Prevention Guidelines for WNV and EEE and Public Health Advisories posted at school fields, recreation fields, Town Green, Senior Citizen Center, Public Library, childcare establishments and Safety Complex. Additionally, various town businesses, including major retail stores, home improvement stores, feed & grain stores, pharmacies and retail food stores have posted the guidelines beside their displays of insect repellants and mosquito control products.
- Courtesy notices are sent to all auto salvage yards and tire stores reminding them that due to the nature of their business there is the potential for increased areas of standing water that could be breeding grounds for mosquitoes. They are notified that they need to adequately maintain their premises free of standing water and that some of their properties may be larval survey sites. Fact sheets on WNV and EEE are included in the notices.

- Information available via the Community Access Channel on personal protection and property maintenance to reduce mosquito breeding opportunities.

**4. Mosquito Control Ordinance:** In May of 2002, Plaistow Selectman adopted a mosquito control ordinance. Owners or persons in control of any piece of property shall, at all times, maintain the outside premises free of any standing water in any barrel, tire, tub, swimming pool cover, ornamental pool, or any other artificial water receptacle, or shall treat and maintain such receptacle in a manner as to prevent the breeding of mosquitoes. Violation of this ordinance is punishable by a fine of not more than \$100 per occurrence.

## **B. Prevention Action Steps**

- 1. Preventing Mosquito Breeding Opportunities:** By reducing their exposure to mosquitoes around their homes and by eliminating mosquito breeding grounds, NH citizens can greatly reduce their risk of mosquito-borne virus exposure. Many species of mosquitoes lay their eggs in standing water. Weeds, tall grass, and bushes all provide an outdoor home for the mosquitoes that are most often associated with WNV. Fresh water swamps and coastal areas provide larval habitat for the mosquito species commonly associated with EEE.

The Plaistow Health Department and NH DHHS recommends citizens take the following steps to reduce opportunities for mosquito breeding:

- ✓ Eliminate standing water around residential and commercial areas and other mosquito breeding locations.
- ✓ Discard outdoor artificial containers such as tin cans, plastic containers, glass bottles, or similar water-holding containers.
- ✓ Remove all discarded tires from your property. The used tire is the most common site for mosquito breeding in the United States.
- ✓ Dispose of or drill holes in the *bottom* of containers left outdoors, such as recycling containers and flower pots. Drainage holes on the sides of containers will still allow enough water for mosquitoes to breed. Do not overlook containers that have become overgrown by aquatic vegetation.
- ✓ Make sure roof gutters drain properly. Clean clogged gutters in the spring and fall and as often as necessary to eliminate standing water.
- ✓ Clean and chlorinate swimming pools, outdoor saunas and hot tubs. If not in use, keep empty and covered. Do not allow these covers to collect standing water.
- ✓ Aerate ornamental pools or stock them with fish. Water gardens become major mosquito producers if they are allowed to stagnate.
- ✓ Turn over wheelbarrows and plastic wading pools when not in use.
- ✓ Change water in birdbaths at least twice weekly.
- ✓ Remind or help neighbors to eliminate breeding sites on their properties.
- ✓ The management of ponds, marshlands, and wetlands is regulated under existing state law and administrative rule. Alteration may require the approval of state and possibly

federal agencies. Contact the NH Department of Environmental Services and Fish and Game for further information.

**2. Personal Protective Measures:** Citizens can take common-sense steps to protect themselves from mosquito bites. Such steps are critical in reducing the risk of WNV and EEE infections. The Plaistow Health Department and NH DHHS under guidance from the Arboviral Illness Task Force recommends that citizens take the following steps to protect themselves, particularly from June to October, when mosquitoes are most active:

- ✓ If outside during evening, nighttime and dawn hours, or at any time mosquitoes are actively biting, children and adults should wear protective clothing such as long pants, long-sleeved shirts, and socks.
- ✓ If outside during evening, nighttime and dawn hours, or at any time mosquitoes are actively biting, consider the use of an effective insect repellent.
- ✓ Repellents containing DEET (N, N-diethyl-methyl-meta-toluamide) have been proven effective. No more than 30% DEET should be used on adults or children.
  - The American Academy of Pediatrics (AAP) Committee on Environmental Health has updated their recommendation for use of DEET products on children, citing: “Insect repellents containing DEET with a concentration of 10% appear to be as safe as products with a concentration of 30% when used according to the directions on the product labels.”
  - AAP recommends that repellents with DEET should not be used on infants less than 2 months old.
- ✓ Repellents containing Picaridin (KBR3023) or oil of lemon eucalyptus (a plant based repellent) or IR3535 provide protection similar to repellents with low concentrations of DEET. Oil of lemon eucalyptus should not be used on children under the age of three years.
- ✓ Always use repellents according to manufacturer’s directions.
- ✓ Do not allow young children to apply repellent themselves.
- ✓ Do not apply repellent directly to children. Apply to your own hands and then put it on the child’s skin.
- ✓ Infants and children should be protected by placing mosquito nets over strollers in the evening, nighttime and dawn hours or at any time mosquitoes are actively biting.
- ✓ The length of time a repellent is effective varies with ingredient and concentration. Avoid prolonged or excessive use of repellents. Use sparingly to cover exposed skin and clothing.
- ✓ Wash all treated skin and clothing after returning indoors.
- ✓ Store repellent out of reach of children.
- ✓ Vitamin B, ultrasonic devices, incense and bug zappers have not been shown to be effective in preventing mosquito bites
- ✓ Make sure that doors and windows have tight-fitting screens. Repair or replace all screens in your home that have tears or holes.
- ✓ For additional information about chemicals contained in repellants, visit the National Pesticide Information Center (NPIC) website at <http://npic.orst.edu/ingred/ptype/repel.html#use>.

**3. Mosquito Control Activities:** The objective of public health mosquito control is to prevent transmission of mosquito-borne disease to humans. Reduction of nuisance mosquito species is not a goal of Public Health-based mosquito control. It is important to emphasize that local communities make the final decisions regarding mosquito control activities in New Hampshire. Communities are responsible for developing, maintaining, and financing mosquito control programs. *Plaistow has financed a comprehensive mosquito control program since 2002.* State legislation has been passed to allow a community to apply for financial assistance in the mitigation of public health threats of mosquito-borne diseases (WNV and EEE) provided the community has already developed a detailed prevention strategy.

All discussion regarding pesticide applications made under this plan will be in accordance with the principles of Integrated Pest Management, (IPM). IPM is a sustainable approach to managing mosquitoes by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks. IPM involves preventive control and suppressive control, including:

- ✓ Source reduction (remove, cover, drain, fill) of larval habitats that are not environmentally sensitive or protected
- ✓ Biological control (the use of natural enemies such as mosquito fish, etc.)
- ✓ Mechanical control (the use of barriers such as screens to prevent the movement of mosquitoes)
- ✓ Chemical control (the use of manufactured chemical products (pesticides) that act against mosquitoes)

Chemical control can be further divided into the application of products aimed at mosquito larvae (larvicide) and those aimed at adult mosquitoes (adulticide). Larvicide involves the application of chemicals or natural bacteria to surface waters (such as ponds or in storm drains) to kill mosquito larvae. Larviciding is a proactive measure that can be useful in reducing the risk of mosquito-borne disease throughout the season. The intent of a larvicide program is to control generations of targeted mosquito species before they reach the adult stage, when they are able to transmit disease such as WNV and EEE. Plaistow's larvicide program begins in the early spring and continues throughout the summer. Adulticide involves the application of fine "mists" of pesticide over a relatively broad area to bring about the rapid knockdown of adult mosquitoes. Adulticiding occurs in response to current surveillance activity. Adulticiding can quickly reduce existing, biting adult mosquitoes throughout a spray area, but its effects are relatively short lived, raising the possibility of repeat applications. Adulticide spray sites have been identified in the town's special permit application. These are considered to be high risk areas, or areas of high human population density. Adulticiding usually occurs in late summer and early fall when infected adult mosquitoes are detected. Plaistow's comprehensive mosquito control plan may utilize both control methods: larvicide pre-season and adulticide later in the season if indicated by surveillance data.

Pesticides may pose their own risk to the health of humans and animals, plants and the environment. Thus pesticides are only one component of a coordinated effort to control

mosquitoes. Pesticide treatments and other IPM strategies may be appropriate in certain situations, while each strategy alone may not be adequate.

IPM dictates that control efforts should be tied to thresholds. This means simply that a certain defined risk needs to exist before particular control methods are recommended. Different responses may be made as different risks are identified. These levels of risk are discussed under the Phased Response section of this plan. In an ideal IPM program, non-chemical methods should be employed to keep pest levels below the risk level that might trigger a pesticide response, meaning that pesticides are a last, rather than first response to a WNV or EEE problem.

## **IV. SURVEILLANCE**

### **A. Mosquito Surveillance for West Nile Virus and Eastern Equine Encephalitis**

Mosquitoes are the best early indicator of human risk for arboviral disease. The objective of a mosquito surveillance program is to determine the presence of arboviruses, including WNV and EEE, in mosquito species common to our area. An effective program begins by targeting mosquito species considered to be important in transmitting disease among birds (primary vector) and transmitting disease from birds to humans (bridge vectors). Monitoring mosquito abundance is accomplished through various surveillance methods including but not limited to measuring larvae (dip counts) and adult mosquitoes (use of light/CO<sub>2</sub> baited traps and gravid traps). Results must be evaluated by mosquito species, as each species has unique biological characteristics that should be incorporated into control decisions. This allows a comprehensive and flexible strategy that modifies certain activities in response to trends in disease risks.

Based on historic and current epidemiology in NH and the United States, NH DHHS may test only particular mosquito species for EEE virus and WNV. Testing decisions will be based on the most current knowledge and intended to ensure a rapid, robust surveillance system. Such decisions will be announced in advance by NH DHHS to the Plaistow Health Department and the contracted mosquito control company.

Activities for mosquito surveillance for the season will consist of routine and rapid response surveillance.

- 1. Routine Mosquito Surveillance:** The Mosquito Control Company contracted by the Town of Plaistow and NH DHHS are the lead agencies responsible for mosquito surveillance activities. Activities include:
  - ✓ Coordinating efforts for appropriate placement of traps, collection, packaging and transport of mosquito specimens. (Mosquito Control Company)
  - ✓ Providing laboratory services for communities that submit mosquitoes for testing and informing municipalities of the results of those tests. (NH DHHS)

- ✓ Notifying municipal and other agency representatives within 24 hours of receiving results of positive virus isolation or a confirmed case of mosquito-borne diseases. (NH DHHS)

Mosquitoes must be collected, frozen, sorted, packed in dry ice and sent to the NH DHHS Public Health Laboratories on a routine, consistent, and timely basis. Mosquitoes must be grouped by species, gender (only females should be submitted for testing) site, and date of collection into a group, or “batch” of 1-50 individual mosquitoes of the same species. These activities are conducted by the Mosquito Control Company contracted by the Town of Plaistow.

In order to ensure testing results are accurate, only mosquitoes trapped in a method approved by NH DHHS will be tested (e.g., light/CO<sub>2</sub>, gravid traps, resting boxes). Mosquitoes trapped using other methods such as Mosquito Magnets are not acceptable for testing.

Routine, fixed long-term trap sites provide the best baseline information for detecting trends in mosquito abundance, virus prevalence and estimating the risk of human infection from WNV and EEE.

**2. Rapid Response Mosquito Surveillance:** In the case of a positive isolation of an arbovirus in non-human mammals, mosquitoes, humans, State sponsored activities may include:

- ✓ Evaluating current trap locations based on criteria including habitats conducive to mosquito breeding and bridge vector collection, and level of human use (e.g., schools, parks, athletic fields).
- ✓ Reviewing and determining the need for expanding trapping in the area surrounding the positive identification.
- ✓ Notifying town municipal officials within 24 hours of receiving results of positive virus isolation or a confirmed case of a mosquito-borne disease.

## **B. Avian Surveillance for West Nile Virus and Eastern Equine Encephalitis**

**1. Bird Testing – WNV and EEE:** Wild bird testing will not occur on a regular basis. WNV dead bird testing has become less useful for early detection and evaluation of WNV risk. Most birds infected with EEE do not succumb to severe disease and no longer provide useful data for disease surveillance and response in NH. In some circumstances, dead birds may be tested for WNV and EEE if the situation warrants (e.g., unusual large die-offs without a known cause). The public is advised to report unusual situations to the animal control or health officer or to contact NH DHHS Infectious Disease Investigation Section at 603-271-4496. The caller will be informed if the reported birds are to be tested and how to safely handle the dead birds to minimize contact and how to arrange for delivery. Otherwise the caller will be informed of proper disposal procedures for the dead bird. If testing is approved, it is the responsibility of the local communities to arrange for the transportation of dead birds to the Public Health Laboratories, such as through local animal control officers. Birds must be approved for testing prior to delivery by calling the WNV & EEE information line.

**2. Laboratory Testing of “Domestic” Birds for WNV and EEE:** Testing and surveillance of domestic birds (e.g., emus) will follow the procedures listed below for veterinary surveillance.

### **C. Veterinary Surveillance for West Nile Virus and Eastern Equine Encephalitis (EEE)**

- ✓ Under the auspices of the State Veterinarian, NH Department of Agriculture, Markets & Food, the NH Public Health Laboratory or the NH Veterinary Diagnostic Laboratory may conduct testing of horses and other domestic animals (e.g., llamas, alpacas) that have severe neurological disease suspected of being caused by EEE virus or WNV infection. On an annual basis, a letter from the State Veterinarian, co-signed by State Public Health Veterinarian (NH DHHS), describing the case definition, clinical signs of disease, prevention measures, and reporting process is sent to all licensed veterinarians in the state of New Hampshire. This serves as a reminder to investigate and report neurological illness in animals. Parameters for the evaluation and testing of ill animals will include the following:
- ✓ Domestic animals with neurologic signs will initially be referred to private veterinarians for evaluation
- ✓ Veterinarians wishing clinical consultation or information on encephalitic disease testing procedures should contact the State Veterinarian at the NH Department of Agriculture, Markets and Foods (271-2404), NH Veterinary Diagnostic Laboratory (862-2726)
- ✓ Necropsy specimens, such as animal heads, must be sent to the NH Veterinary Diagnostic Laboratory for processing. The NH Veterinary Diagnostic Laboratory will then send tissue samples to the NH Public Health Laboratory for further testing.
- ✓ The State Veterinarian and NH Veterinary Diagnostic Laboratory will assure appropriate collection of specimens for diagnostic testing.
- ✓ Appropriate submission forms must accompany specimens. (Available at: <http://www.dhhs.nh.gov/dphs/cdcs/arboviral/animals.htm>).

### **Mammals Submitted for Rabies Testing**

Unlike an arbovirus, rabies can be transmitted to humans through the bite of an infected animal. It is important that all mammals with neurological symptoms that have had contact with humans, pets, or domestic animals, and that meet guidelines for rabies testing, be submitted for testing in accordance with the NH Public Health Laboratories guidelines. Animals testing positive for rabies will not be tested for WNV and EEE virus.

### **D. Communication of Surveillance Information**

**1. Routine Information:** Arboviral laboratory test results are compiled on a daily basis and information summarized in tabular and map formats to identify areas of virus activity. A link to NH DHHS for the current test results is available at [www.plaistow.com](http://www.plaistow.com) on the Health page.

Testing time varies with test method, specimen, and concentration of virus present and confirmation testing requirements; therefore, new test results may not be available every day.

**2. Positive EEE Virus, WNV & JCV Findings:** The NH DHHS ensures the rapid and accurate dissemination of positive test results. Following a EEE or WNV positive mosquito batch, veterinary case, or positive EEE, WNV or JCV human, all pertinent parties both internal and external to DHHS are concurrently notified.

- a. Internal Notification: Following a positive result, the Director of the Division of Public Health Services (DPHS) immediately notifies the Commissioner of DHHS. A member of the Communicable Disease Control Section notifies the DHHS Health Officer Liaison. The DHHS Public Information Officer, at the direction of the Commissioner, works with DPHS to issue an appropriate press release. Prior to sending out the press release, DPHS ensures all pertinent parties external to DHHS (see below) have been notified.
- b. External Notification: External parties include the Departments of Agriculture, Markets & Food, Fish and Game, Environmental Services, Education, Resources and Economic Development, local town officials, and medical professionals. Information is provided by the most efficient means, usually an email, telephone call or fax within 24 hours of confirmation. Other agencies that are involved in surveillance and intervention activities are also provided results by the most efficient means, as determined by the recipient agency. The specific external parties notified varies with the surveillance component that is positive.
  1. Mosquitoes: a member of the Infectious Disease Investigation Section provides positive laboratory test results or other priority reports to the submitter and the Plaistow Health Officer.
  2. Veterinary Cases (may include horses, llamas, alpacas, or domesticated birds such as emus): a member of the Bureau of Infectious Disease Control provides positive laboratory results directly to the State Veterinarian, followed by the submitting veterinarian who will, in turn, notify the animal owner. After the submitting veterinarian has been notified, the Plaistow Health Officer will be informed of the positive results.
  3. Human Cases: a member of the Bureau of Infectious Disease Control Section provides positive laboratory results directly to the health care provider of the patient and to the Plaistow Health Officer of the patient's residence. Other state and federal agencies are notified as soon as possible.

Local notification will occur individually for the town affected or as a region depending on the significance of the test results. The NH DHHS Community Public Health Development Section (e.g. Health Officer Liaison) will assist in local notification (phone and/or e-mail) if Disease Investigation staff is unable to make contact with the Health Officer. It is the duty of the Plaistow Health Officer to notify all pertinent local officials. If the Health Officer is unable to be contacted, notification will be made to the Town Manager. The public will be informed, but only after the Plaistow Health Officer and external parties listed above (1-3) are notified. In addition to press releases, the media and public will be informed of positive results through the DHHS and Plaistow website. NH DHHS will determine the human risk level for the region and disseminate this information through the measures discussed. The CDC receives timely results of all positive test results.

**3. Media Advisories:** The NH DHHS issues media advisories when surveillance information indicates risk of human disease. Media advisories include information on personal protection measures, identify areas of virus activity, and explain activities of the surveillance program.

**4. DHHS Website and Plaistow Website:** The NH DHHS and Town of Plaistow informs the media and public of positive test results, regions of increased disease risk, and other important up-to-date information through their websites:

- <http://www.dhhs.state.nh.us/DHHS/CDCS/West+Nile+Virus/default.htm>,
- <https://www.plaistow.com/>.

Information regarding personal protection measures, general information, and regular updates on surveillance and laboratory analysis is available at both sites. Surveillance information is updated as it becomes available. Maps presenting the geographical distribution of EEE virus and WNV activity and regional risk are available at these sites and updated as new activity occurs. Links to other mosquito-borne virus informational websites, including community health departments, and state and federal agency sites are included.

**5. Public Health Alerts:** The NH DHHS issues media advisories to alert the public of conditions that may warrant additional precautions to reduce the risk of disease. These alerts are drafted in consultation with local health agents to coordinate local prevention activities. The Health Alert Network (HAN) will be utilized by the NH DHHS to disseminate information to health care providers in the State.

## **V. RECOMMENDATIONS FOR A PHASED RESPONSE TO EEE VIRUS AND WNV SURVEILLANCE DATA**

The recommendations provided here are based on current knowledge of risk and appropriateness of available interventions to reduce the risk for human disease. Multiple factors contribute to the risk of mosquito-transmitted human disease. Decisions on risk reduction measures should be made after considerations of all surveillance information for that area at that time.

Public awareness of what can be done to reduce risk of infection is of utmost importance. The level of EEE virus and WNV activity in mosquitoes and veterinary samples may occasionally present a potential for increased virus transmission to humans. Typically, risk is expected to be relatively low, and the routine precautions taken by individuals may be sufficient to avoid infection. These guidelines take into consideration the complexity of reducing risk of human disease from EEE virus and WNV infection, and JCV and form a framework for decision-making. They are not a set of specific prescriptions.

**1. Phased Response:** General guidelines are provided for an array of situations that are noted in the Surveillance and Response Plan Tables that follow. Specific situations must be evaluated, and options discussed before final decisions on specific actions are made. The assessment of risk

from mosquito-borne disease is complex and many factors modify specific risk factors. The Plaistow Health Department works with NH DHHS, community and school administrators and mosquito control contractors to develop the most appropriate prevention activities to reduce the risk of human disease. There is no single indicator that can provide a precise measure of risk, and no single action that can assure prevention of infection.

When recommending the use of mosquito larvicides and adulticides, the Plaistow Health Department and NH DHHS work to identify and support the use of risk reduction and disease prevention methods that are specific to the cause of disease, that use the least intrusive and most appropriate prevention methods, and that support planning and practices that reduce the use of pesticides.

Historical local surveillance data is critical in making informed decisions regarding risk and appropriate actions. The contracted mosquito control company for the Town of Plaistow provides surveillance data to aid in decision-making and early detection of arboviral activity.

**2. NH DHHS Guidance:** Throughout the arboviral season, the NH DHHS Arbovirus Program will determine human risk levels as outlined in the phased response tables of this plan. Currently, EEE and WNV mosquito, veterinary and human surveillance data, as well as JCV human surveillance data are analyzed to determine human risk levels. Arboviral risk levels set by the NH DHHS Arbovirus Program refer only to risk posed by mosquito-borne arboviruses and are defined for focal areas. “Focal Areas” may incorporate multiple communities, towns, or cities. Factors considered in the determination of human risk in a focal area include: mosquito habitat, mosquito abundance, current and historic virus activity, timing of recent isolations of virus in mosquitoes, current and predicted weather and seasonal conditions needed to present risk of human disease. Known/suspected location of exposure is used for human and veterinary cases and not necessarily town of residence. Determined risk levels will be announced to the public, local officials, and state partners through the means listed (i.e., press releases, DHHS website, emails, public health alerts).

**Table 1. Guidelines for use of Arboviral Surveillance Data to Determine Arboviral Risk Categories**

Risk Category	Probability of human illness	West Nile Virus Definition of a Focal Area*	Eastern Equine Encephalitis Virus Definition for a Focal Area*	Jamestown Canyon Virus Definition of a Focal Area*
1	Baseline/ No data	<p>All of the following conditions must be met:</p> <p><u>Prior Year</u> No activity detected in a community or focal area.</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> No current surveillance findings indicating WNV activity in the focal area.</p>	<p>All of the following conditions must be met:</p> <p><u>Prior Year</u> No activity detected in a community or focal area</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> No current surveillance findings indicating EEE activity in the focal area</p>	<p>All of the following conditions must be met:</p> <p><u>Prior Year</u> No activity detected in a community or focal area</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> No current surveillance findings indicating JCV activity in the focal area</p>

2	Low	<p><u>Prior Year</u> Virus activity detected in mosquitoes</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> Surveillance of mosquitoes collected at a single mosquito trap location testing positive</p> <p style="text-align: center;"><b>And</b></p> <p>No human or veterinary cases</p>	<p><u>Prior Year</u> Virus activity detected in mosquitoes</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> Virus identified in an enzootic mosquito species (e.g., Culiseta melanura)</p> <p style="text-align: center;"><b>And</b></p> <p>No human or veterinary cases</p>	N/A
3	Moderate	<p><u>Prior Year</u> Confirmation of human and/or veterinary case(s)</p> <p style="text-align: center;"><b>Or</b></p> <p>Sustained WNV activity in mosquitoes</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> Positive mosquitoes at more than one trap location</p> <p style="text-align: center;"><b>And</b></p> <p>No human or veterinary cases</p>	<p><u>Prior Year</u> Confirmation of human and/or veterinary case(s)</p> <p style="text-align: center;"><b>Or</b></p> <p><u>Current Year</u> Multiple EEE virus mosquito isolates; or EEE virus isolated in bridge vectors</p> <p style="text-align: center;"><b>And</b></p> <p>No human or veterinary cases</p>	<p><u>Prior Year</u> Confirmation of JCV human case(s)</p>
4	High	<p><u>Current Year</u> Surveillance of sustained or increasing WNV activity in mosquitoes</p> <p style="text-align: center;"><b>Or</b></p> <p>A single confirmed veterinary or human case</p>	<p><u>Current Year</u> EEE virus mosquito isolation rates in an enzootic mosquito species (i.e., Culiseta melanura) are rising and area of EEE virus activity is spreading</p> <p style="text-align: center;"><b>Or</b></p> <p>A single confirmed veterinary or human case</p>	<p><u>Current Year</u> A single confirmed JCV human case</p>
5	Very High	<p><u>Current Year</u> More than 1 confirmed WNV human case</p> <p style="text-align: center;"><b>Or</b></p> <p>More than one confirmed WNV veterinary cases.</p>	<p><u>Current Year</u> More than one confirmed human EEE case</p> <p style="text-align: center;"><b>Or</b></p> <p>More than one confirmed EEE veterinary cases</p> <p style="text-align: center;"><b>Or</b></p> <p>Multiple measures indicating very high risk of human infection (e.g., multiple isolations from bridge vectors associated in time and space and veterinary case</p>	<p><u>Current Year</u> More than one confirmed JCV human case</p>

**Table 2. Guidelines for Phased Response to Arbovirus Surveillance Data**

Risk Category	Probability of human outbreak	Definition for a Focal Area*	Recommended Response for the Public and Individuals in Affected Areas
1	Baseline/ No data	<ol style="list-style-type: none"> <li>1. Educational efforts directed to the public on personal protection and source reduction.</li> <li>2. Routine human and veterinary surveillance.</li> <li>3. Assess local ecology for mosquito abundance.</li> <li>4. Consider larval and adult mosquito monitoring with routine collection and testing of mosquitoes.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair Screens</li> <li>2. Dump standing water weekly</li> <li>3. Wear mosquito repellent when outdoors during peak mosquito hours (from dusk to dawn)</li> <li>4. Wear long sleeves and long pants when outdoors during peak mosquito hours (from dusk to dawn)</li> <li>5. Use mosquito netting on baby carriages and playpens when outdoors</li> <li>6. Arrange neighborhood clean-ups to get rid of mosquito breeding sites</li> <li>7. Be aware of stagnant water on property (e.g., unused swimming pools) and consult local health officer</li> <li>8. Clean roof gutters so that rainwater cannot collect in them.</li> <li>9. Do not attempt to drain or alter natural water bodies such as ponds, marshlands, and wetlands as they are regulated under state law and any alterations may require the approval of state and possibly federal agencies.</li> </ol>
2	Low	<p>Incorporates previous category response, plus:</p> <ol style="list-style-type: none"> <li>1. Expand community outreach and public education programs focused on risk potential and personal protection, emphasizing source reduction.</li> <li>2. Assess mosquito populations, monitor larval and adult mosquito abundance, submit samples to PHL for virus testing.</li> <li>3. Use larvicides at specific sources identified by entomologic survey and targeted at vector species. If appropriate, consider source reduction techniques. If current year activity includes EEE virus isolates in mosquitoes, may consider adulticiding based on current regional epidemiology and surveillance efforts.</li> <li>4. Enhance human and veterinary surveillance.</li> </ol>	<p>Incorporates previous category response</p>
3	Moderate	<p>Incorporates previous category response, plus:</p> <ol style="list-style-type: none"> <li>1. Increase larval control, source reduction, and public education emphasizing personal protection measures.</li> <li>2. Actions to prevent disease may include targeted larviciding, and if current year activity, possibly ground adulticiding targeted at likely bridge vector species.</li> <li>3. Enhance human surveillance and activities to further quantify epizootic activity.</li> </ol>	<p>Incorporates previous category response</p>

4	High	<p>Incorporates previous category response, plus:</p> <ol style="list-style-type: none"> <li>1. Intensify public education on personal protection measures <ul style="list-style-type: none"> <li>• Utilize multimedia messages including press releases, local newspaper articles, cable channel interviews, etc.</li> <li>• b. Actively seek out high-risk populations (nursing homes, schools, etc.) and educate them on personal protection.</li> <li>• c. Issue advisory information on adulticide spraying.</li> </ul> </li> <li>2. Consider intensifying larviciding and/or adulticiding control measures as indicated by surveillance.</li> <li>3. DHHS will confer with health officer to determine if the risk of disease transmission threatens to cause multiple human cases. If surveillance indicates a continuing risk of human disease and potential for an outbreak, intensified ground-based adult mosquito control may be recommended</li> </ol>	<p>Incorporates previous category response, plus:</p> <ol style="list-style-type: none"> <li>1. Avoid areas with heavy mosquito activity</li> <li>2. Adjust outdoor activity to avoid peak mosquito hours (from dusk to dawn)</li> </ol>
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5	Very High	<p>Incorporates previous category response, plus:</p> <ol style="list-style-type: none"> <li>1. Continued highly intensified public outreach messages through community leaders and the media emphasizing the urgency of personal protection.</li> <li>2. If risk of outbreak is widespread and covers multiple jurisdictions, DHHS will confer with local health officials and Arboviral Illness Task Force members to discuss the use of intensive mosquito control methods. A State of Emergency may be declared pursuant to RSA 21-P:35.</li> </ol> <p>Factors to be considered in making this decision include the cyclical, seasonal and biological conditions needed to present a continuing high risk of EEE human disease.</p> <p>The declaration of an emergency may trigger application of mosquito adulticide. DHHS may define targeted treatment areas for vector control following the declaration of an emergency.</p> <ol style="list-style-type: none"> <li>3. Ground-based adulticide applications may be repeated as necessary to achieve adequate control.</li> </ol>	<p>Incorporates previous category response, plus:</p> <ol style="list-style-type: none"> <li>1. Consider cancelling or rescheduling outdoor gatherings, organized sporting events, etc., during peak mosquito hours</li> </ol>
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