

Town of Kingston, New Hampshire

Arboviral Illness

Surveillance, Prevention and Response Plan

2006 Season

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I. INTRODUCTION

The 2006 Arboviral Illness Surveillance, Prevention and Response plan provides surveillance and phased response guidance for both the West Nile virus (WNV) and Eastern Equine Encephalitis (EEE) virus. The purpose of this plan in conjunction with the New Hampshire Department of Health and Human Services (NH DHHS) 2006 Arboviral Illness Surveillance plan is to provide guidance on operational aspects of surveillance, prevention and response by the Town of Kingston for the control of mosquito-borne disease and encourage proactive preparations for the 2006 season. The Town of Kingston Health Department (KHD) will continue to seek advice from its partners and collaborators and modify the plan, as appropriate.

This document is open to continual review and evaluation by the Town of Kingston with changes made when there is opportunity for improvement. Key objectives contained in this plan provide for the monitoring of trends in EEE virus and WNV in the Town of Kingston, providing timely, detailed and summary information on the distribution and intensity of WNV and EEE virus in the environment, laboratory diagnostic testing of WNV and EEE for humans, horses and other animals, and communicating guidelines, advice and support on activities that effectively reduce risk of disease.

II. 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 NH human case identified in 2004; and West Nile virus (WNV) with the first NH human cases in 2003.

A. Eastern Equine Encephalitis Virus

EEE virus is an alphavirus, enzootic in many passerine bird species (perching song birds) 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 bird populations with occasional “incidental” 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.

Most people infected with EEE will not have symptoms of 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 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 neurologic damage. Human cases of EEE occur sporadically in the United States. Historically,

clusters of human cases have occurred in sequential cycles of 2-3 years, with a hiatus of numerous years between outbreak and high-risk years. Between 1964 and 2000, 182 human cases of EEE were reported in the US, with an average of 5 cases per year. These cases were all reported from eastern states, with most of the cases occurring in Florida (53 cases), Georgia (22 cases), Massachusetts (21 cases) and New Jersey (17 cases).

Prior to 2004, the most recent EEE activity documented in New Hampshire was several equine cases (1982). In 2004, 3 emus, 3 horses, 19 mosquito pools and one human EEE case were reported. In 2005, 7 human cases were identified resulting in 2 deaths. Also in 2005, 54 birds (including 2 emus), 9 horses, 4 alpacas, 1 llama and 15 mosquito pools all tested positive for EEE.

The incidence of EEE infection in humans varies by geographical area. Human EEE disease is more common in areas that support dense populations of passerine birds and have favorable breeding conditions for the enzootic 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 in Merrimack and Hillsborough counties.

The other major factors that affect the risk of human EEE infection are 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, and likelihood of mosquito exposure. The use of personal protective measures (avoidance of mosquitoes, use of repellent) by people reduces their risk of exposure and infection.

B. West Nile Virus

WNV is a flavivirus. Similar to EEE, WNV is also maintained in the environment in an enzootic cycle that involves birds, with indiscriminant feeding mosquitoes infecting humans and other mammals. WNV is known to result in the death of certain species of birds, especially corvids (i.e. American crows, blue jays). The high mortality of WNV infections in birds provides sentinel information for possible risk of human WNV infections. WNV causes sporadic disease in humans, and occasionally results in significant outbreaks. More than 2600 human cases of WNV neuroinvasive disease (West Nile meningitis and West Nile encephalitis) and WNV fever were reported nationwide to the Centers for Disease Control and Prevention (CDC) in 2005.

WNV was first identified in New Hampshire in August of 2000 in an infected dead crow. By the end of the 2000 season, 7 positive birds were reported. During the 2001 season, 83 positive birds (from the southeast portion of the state), 3 mosquito pools (from Salem and Dover) and 2 horses (from Newton and Kingston) were reported. Surveillance for the 2002 season detected WNV in 119 birds and 33 mosquito pools. The distribution of birds and mosquitoes was again in the southern half of the state. The 2003 season resulted in 213 birds testing positive, as well as 6 mosquito pools, 1 horse, and 3 humans. During the 2004 season 14 birds tested positive. During the 2005 season, 46 birds and 1 mosquito pool tested positive for WNV.

WNV affects the central nervous system. 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.

West Nile virus activity varies from year to year. When there are both a large number of infected birds and a high proportion of infected mosquitoes in a relatively small geographic area the risk of transmission of virus to humans will increase.

III. PROGRAM GOALS

Timely and accurate information provided by the Kingston Health Department and the NH DHHS may offer an early warning of increased risk of WNV and EEE virus infection of humans or non-human mammals. Based on surveillance information, plans and actions to reduce risk can be developed and implemented when needed.

Kingston Health Department Specific Program Priorities

1. Provide expertise in proactively minimizing the risk to Kingston citizens and visitors of being exposed to and infected with mosquito-borne diseases.
2. Providing assistance to contracted mosquito- control company in identifying potential breeding sites for mosquitoes.
3. Document calls from the public regarding dead birds.
4. Submit birds and 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.

IV. PREVENTION AND CONTROL

Ultimately, the key to reducing or eliminating the incidence of arboviral disease is education and outreach to the public regarding the need for prevention and explaining how they can protect themselves from diseases such as EEE and WNV. Like much of the work in public health, it is difficult to quantify exactly how effective these prevention efforts are or will be. For example, with a rare and cyclical disease such as EEE, it would be impossible to identify the number of cases that were avoided in the 2005 season as result of an aggressive and sustained public education campaign by DHHS and its state, local, and community partners.

The emergent public health threat posed by arbovirus illness requires a vigilant outreach effort. As the local public health entity, Kingston 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, businesses and special populations, such as schools, the homeless and others who spend considerable amounts of time outside, like hunters and fishers.

A. Prevention Through Knowledge

The goal of all mosquito-borne virus public information activities is to provide the citizens of Kingston with helpful, accurate and specific advice and information 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 town activities:

- ✓ West Nile virus general information
- ✓ Eastern Equine Encephalitis general information
- ✓ Health risks to humans and domestic animals from arboviral illnesses
- ✓ Personal protective measures
- ✓ Special information for the elderly
- ✓ Special information for schools, camps and daycare facilities
- ✓ How to minimize mosquito breeding opportunities in the backyard
- ✓ Mosquito biology
- ✓ Pesticide options for communities to use in mosquito control activities

1. Printed Materials: Fact sheets on the above topics are available at the Kingston Town Hall. As additional fact sheets and other printed materials are developed, and existing fact sheets are amended, they will also be made available at the Town Hall.

2. WNV & EEE Website: The Health page of the Town of Kingston website, www.kingstonnh.org serves as a central source for up-to-date, accurate, WNV and EEE information. Information provided on the site includes general background information and regular updates on surveillance and laboratory analysis. Links to other informational websites, and state and federal agency sites are included.

3. Community Outreach: Prior to and during the surveillance season, the Kingston 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, Public Library, childcare establishments. Additionally, various town businesses have posted the guidelines beside their displays of insect repellants and mosquito control products.
- Courtesy notices are sent to all auto salvage yards 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 dead bird reporting and property maintenance to reduce mosquito breeding opportunities

- During the surveillance season, a toll-free DHHS WNV & EEE informational phone line, 1-866-273-NILE (6453), provides information to callers on a variety of WNV and EEE topics.

4. Vector Control Health Regulation: In June of 2006, the Kingston Board of Health adopted a vector control Health regulation. 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 day 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, Kingston residents 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 common house mosquitoes that are most often associated with WNV. Fresh water swamps and coastal areas provide breeding habitat for the mosquito species commonly associated with EEE.

The Kingston 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.
- ✓ 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 recycling containers left outdoors. These items include tin cans, plastic containers, ceramic pots, or similar water-holding containers. Drainage holes in 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 change water in birdbaths at least twice weekly. Both provide breeding habitat for domestic mosquitoes.
- ✓ Turn over plastic wading pools when not in use.
- ✓ Eliminate any standing water that collects on your property. Mosquitoes can develop in puddles that last more than 4 days.
- ✓ Remind or help neighbors to eliminate breeding sites on their properties.

2. Personal Protective Measures: Kingston residents 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 Kingston 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) 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.
- ✓ 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.

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 may be an added benefit. 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. ***Kingston has financed a comprehensive mosquito control program since 2005.*** 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 as outlined in the State of New Hampshire Arboviral Illness surveillance, prevention and response plan.

The use of pesticides in NH is governed by state law and by the Administrative Rules of the Pesticide Control Board, Chapters Pes 100-1100. These statutes and rules require people applying pesticides, other than homeowners on their own property, hold licenses issued by the New Hampshire Department of Agriculture, Markets and Food. In certain circumstances, special permits are required in addition to licenses, examples being any larviciding treatments made to surface water or for adulticiding treatments within a public watershed, or along a public roadway. The Division of Pesticide Control at the Department of Agriculture, Markets and Food, in consultation with other interested state agencies, issues these special permits after all such agencies have reviewed the proposed treatment program.

Although certain pesticide products are available for sale in the marketplace to control mosquito larvae, application of these products to any surface waters in NH is governed through permits obtained from the Department of Agriculture, Markets and Food, Division of Pesticide Control. Questions regarding how to apply for such special permits should be directed to the NH Department of Agriculture, Division of Pesticide Control at 603-271-3550.

Special Permit for mosquito control

The Town of Kingston, in conjunction with Dragon mosquito control, Inc. has obtained a special permit from New Hampshire Department of Agriculture, Markets & Food to conduct a mosquito control program for the year 2006.

V. SURVEILLANCE

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

Mosquitoes are the best indicator of human risk for arboviral disease. The objective of mosquito surveillance is to determine the presence of arboviruses, including WNV and EEE, in mosquito species common to our area and to measure the relative abundance of critical mosquito species. Monitoring mosquito abundance and reduction is accomplished through various surveillance methods including but not limited to larval dip counts and the use of light/CO₂ baited traps and gravid traps. Dragon mosquito Control, Inc. uses a comprehensive and flexible strategy that modifies certain surveillance activities in response to trends in disease risk.

Mosquito season begins after the snow melts. Larval surveys are conducted from April through September. Freshwater sites are checked in the spring after the snow and ice melts or after heavy rains. Catch basins are checked from late May into September. Inspection of a breeding site reveals the location of any mosquito breeding, the life stage of the mosquitoes (1st-4th instar larvae or pupae), the density of the population (#/dip), the condition of the site (water depth or distribution) and other site characteristics such as fish distribution. Two or more workers randomly sample the stagnant water using 500 ml cups known as dippers. The number of mosquitoes sampled in each positive dip is averaged. The average per dip and larval instar are recorded in addition to their distribution throughout the site, site name, location, date, inspectors, access points, weather conditions and comments.

Activities for mosquito surveillance for the 2006 season will consist of routine and rapid response surveillance.

1. Routine Mosquito Surveillance: Larval surveys are conducted in areas where stagnant water collects such as swamps, roadside ditches, woodland depressions, and catch basins. Farms, sewage treatment plants, junk yards, and tire piles are all places we need to inspect. Container breeding sites such as birdbaths, rain barrels, flower pots, and children's swimming pools can be emptied of water thereby eliminating developing larvae. These sites need to be checked weekly by the homeowner. Streams clogged with debris can overflow creating stagnant pockets which allow larval survival. Clearing away debris keeps the stream moving and washes away any mosquito larvae. Old tire tracks can hold enough water to provide a breeding habitat for mosquitoes. Filling in these tracks eliminates the breeding site. When a larval survey reveals an average of 2 larvae per dip, insecticide treatment is recommended. Larval dipping may continue throughout the treatment to isolate spraying to areas where larvae are found. In some locations, predators such as fish feed on mosquito larvae eliminating the need for spraying.

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

- ✓ Placing mosquito traps within a two-mile area surrounding the positive identification point. Criteria for selection of trap locations will include areas such as mosquito breeding locations, standing water, swamps and sewage plants.
- ✓ Reviewing and determining the need for expanding trapping to new areas.
- ✓ Notifying city and 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. Dead Bird Reports: Crows and Blue Jays (corvids) often die following infection with WNV. Corvids, as well as passerines (i.e. perching birds or “songbirds”), are also susceptible to infection with EEE. Following changes in bird mortality can help identify areas of increased viral activity.

The town plan calls for timely reporting of all dead birds, and the submission of selected dead birds for WNV and EEE testing. The objective is to enhance surveillance for animal arboviral infection and disease. The starting date for bird surveillance activities will begin on June 1, 2006 and will end October 31, 2006. Reports of dead birds are taken via a phone call to the **Kingston Police Department at 642-5742**. The report is then forwarded to the Animal Control Officer (ACO) for bird pick-up and to the Health Officer for recording the report, notifying DHHS, and arranging for transportation of the dead bird to the Public Health Laboratory. The Kingston Health Department and NH DHHS will record and analyze dead bird reports, which will be used

to identify areas for intensified surveillance of virus activity including bird testing, mosquito trapping and active disease surveillance.

2. Laboratory Testing of Dead Wild Birds for WNV and EEE: For the 2006 season, laboratory testing of dead birds will occur in communities which are able to collect and transport the specimen to the Public Health Laboratory in Concord. It is the responsibility of the Town of Kingston to arrange for the transportation of dead birds to the Public Health Laboratory. Birds must be approved for testing prior to delivery by calling the WNV & EEE information line.

The NH DHHS Public Health Laboratories will test dead birds, primarily crows and blue jays, for WNV and EEE. Ongoing evaluation of reports of dead birds may indicate the need for increased testing of birds and/or mosquitoes to better assess virus transmission among the bird and mosquito populations at particular times throughout the season.

All bird deaths should be reported to the Kingston Police Department. The Kingston Police Department will notify the ACO and Health Officer of the date and time of the call, the location of the bird, and any other pertinent information. The ACO will make the determination at time of pick-up if the bird will or will not be suitable for documenting and possible testing. Some reasons a dead bird may not be documented may include a bird that; was killed by an animal, hit a window or structure, run over by a vehicle, or in an extreme state of decomposition. If the bird is suitable for testing, the ACO will bag and label it appropriately and store in the freezer at the Town Kennel. The Health Officer will record the information, and report it to NH DHHS WNV/EEE Program Coordinator for approval for testing. The Health Officer will make appropriate arrangements for transportation. If the bird is not suitable for testing, the ACO will use proper disposal procedures for the dead bird.

There are no indicators developed that show severity of local infection or higher risk for humans with an increased number of positive birds. Therefore, the NH DHHS has determined that wild bird testing may be discontinued in a community, after a positive finding in the surrounding area, based on a specific area's demographics. In areas where there has been documented activity in a previous year, one positive bird will be adequate to document that an endemic situation has continued. Areas without previously documented activity will be assessed individually.

3. Laboratory Testing of Owned Birds for WNV and EEE: Testing and surveillance of owned birds (e.g., emus) will follow the procedures listed below for mammal (non-human) surveillance.

C. Mammal (Non-human) 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, and reporting process will be sent to all licensed veterinarians in the state of New Hampshire. This will serve as a reminder to investigate and report neurological illness in non-human mammals. Parameters for the evaluation and testing of ill mammals will include the following:

- ✓ Owned animals with neurologic signs will initially be referred to private veterinarians for evaluation
- ✓ Veterinarians wishing clinical consultation for encephalitis should contact the State Veterinarian at the NH Department of Agriculture, Markets and Foods (271-2404), NH Veterinary Diagnostic Laboratory (862-2726), or State Public Health Veterinarian (271-4496)
- ✓ Necropsy specimens, such as animal heads, must be sent to the NH Veterinary Diagnostic Laboratory for processing, after which they will be sent to the 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.

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. Results of birds submitted for testing are posted as they become available on the NH DHHS website accessible to the public and media. A link to NH DHHS for the current test results is available at www.kingstonnh.org on the Health page. Testing time varies with test method, specimen, and concentration of virus present; therefore, new test results may not be available every day.

2. Positive EEE Virus & WNV Findings: The NH DHHS ensures the rapid and accurate dissemination of positive test results. Following an EEE or WNV positive mosquito pool, bird, non-human mammal, or human, all pertinent parties both internal and external to DHHS are notified. Both external and internal parties are notified concurrently. 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 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. In addition to press releases, the media and public will be informed of positive results

through the DHHS website. The notification of parties external to DHHS varies with the surveillance component that is positive

- a. **Positive EEE virus & WNV Wild Birds and Mosquitoes:** A member of the Communicable Disease Control Section provides positive laboratory test results or other priority reports for wild birds and mosquitoes directly to the submitter and the designated Kingston Health Officer. This information is provided by the most efficient means, usually a telephone call or fax within 24 hours of confirmation. Assistance will be requested from the Health Officer Liaison if staff is unable to make contact with the Health Officer. It is the duty of the Kingston Health Officer to notify all pertinent local officials. 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.
- b. **Positive EEE virus & WNV Non-human Mammals and Owned Birds:** A member of the Communicable Disease Control Section provides positive laboratory results for non-human mammals and owned birds directly to the State Veterinarian, followed by the submitting veterinarian who will, in turn, notify the animal owner. After the submitting veterinarian is notified, the Kingston Health Officer will be informed of the positive result. Assistance will be requested from the Health Officer Liaison if staff is unable to make contact with the Health Officer. It is the duty of the Kingston Health Officer to notify all pertinent local officials. The public will be informed, but only after the State Veterinarian, submitting veterinarian, animal owner and Kingston Health Officer are notified. The Centers for Disease Control and Prevention (CDC) receives weekly summaries of all samples tested and timely reports of significant positive test results.
- c. **Positive EEE Virus & WNV Human Cases:** Laboratory confirmation of a human case of WNV or EEE is reported by a member of the Communicable Disease Control Section to the health care provider of the patient and to the Kingston Health Officer of the patient's residence. Assistance will be requested from the Health Officer Liaison if staff is unable to make contact with the Health Officer. It is the duty of the Kingston Health Officer to notify all pertinent local officials. Other state and federal agencies are notified as soon as possible. The public will be informed, but only after the medical provider and Kingston Health Officer are notified.

3. DHHS Website and Kingston Website: The NH DHHS and the Town of Kingston informs the media and public of positive test results and other important up-to-date information through its website (<http://www.dhhs.nh.gov>) (<http://www.kingstonnh.org>). Information regarding personal protection measures, general background 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 are available at this site and updated weekly as new activity occurs. Links to other mosquito-borne virus informational websites, including community health departments, and state and federal agency sites are included.

4. Informational Phone Line: During the surveillance season, a toll-free DHHS WNV & EEE informational phone line, 1-866-273-NILE (6453), provides information to callers on a variety of

WNV and EEE topics including general background information, personal protection measures, and dead bird testing submission requirements. A staff member is dedicated to this line and is available to assist callers during business hours. Messages may be left after hours and are returned the next business day.

5. Public Health Alerts: The NH DHHS issues media advisories to alert the public of conditions that may warrant extra 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.

VI. RECOMMENDATIONS FOR A PHASED RESPONSE TO EEE VIRUS AND WNV SURVEILLANCE DATA

1. Kingston Health Department Guidance: 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 consideration of all surveillance information for that area at that time.

Recommendations regarding the WNV phased response plan (Table 1) and the EEE virus phased response plan (Table 2) incorporates several components presented in the CDC document “Epidemic/Epizootic West Nile virus in the United States: Guidelines for Surveillance Prevention, and Control”, 3rd Revision, 2003, as well as results of analyses of surveillance data collected in New Hampshire and throughout the northeastern United States.

Public awareness of what can be done to reduce risk of infection is of utmost importance. The level of EEE virus and WNV activity 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 form a framework for decision-making. They are not a set of specific prescriptions.

2. 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 Kingston Health Department in conjunction with NH DHHS and mosquito control contractors work 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. Historical local surveillance data is critical in making informed decisions regarding risk and appropriate actions. As time progresses our gathering of surveillance data will ultimately make decisions easier.

Table 1. Guidelines for Phased Response to WNV Surveillance Data

Risk Category	Probability of human outbreak	Definition	Recommended Response
1	Remote	No prior year virus activity detected in a community or adjacent community	1. Dead bird reporting and recorded information via DHHS WNV info-line. 2. Seasonal collection and testing of birds for WNV. 3. Mosquitoes collected and tested. 4. Assess local conditions for mosquito species of major public health significance. 5. Passive human and horse surveillance. 6. Emphasis on mosquito breeding site source reduction.
2	Low	Areas anticipating WNV epizootic based on WNV activity in the prior year in the community or adjacent community. Current year surveillance of: One or more positive birds; or Mosquitoes collected at a single mosquito trap location that have tested positive.	Incorporates previous category response, plus: 1. Assess mosquito populations, monitor larval and adult mosquito density. 2. Evaluate the need and feasibility of increased mosquito trapping in the area of the virus isolation. 3. If not already applied for, local officials will consider applying for a pesticide application permit. 4. Initiate source reduction. In making a decision to use larvicide consider the prevalence of <i>Culex</i> larvae, intensity of prior virus activity, and weather. 5. Enhance passive surveillance of human encephalitis/meningitis and equine illness. 6. Expand community outreach and public education programs focused on risk potential and personal protection, emphasizing source reduction.
3	Moderate	Areas with limited or sporadic WNV epizootic activity in birds and/or mosquitoes which may include: A positive horse or other domestic animal; or Mosquitoes collected at more than one trap location in a town; or Multiple mosquito species collected at any trap location; or A single infected person, without positive birds or mosquitoes discovered locally, if it is found the person was infected in New Hampshire.	Incorporates previous category response, plus: 1. Evaluate the need and feasibility of increased mosquito trapping beyond town lines. 2. Increase larval control, source reduction, and public education emphasizing personal protection measures, particularly among the elderly. 3. Enhance human surveillance and activities to further quantify epizootic activity (e.g., mosquito trapping and testing). 4. Consider targeted adult mosquito reduction activities, including ground-based pesticide application.

4	Moderate/High	Areas with current year confirmation of epizootic WNV in birds. A single horse or human case; and Confirmation of WNV in multiple mosquito species, including bridge vector species, and at multiple mosquito trap locations or in multiple cases involving birds or other mammals.	Incorporates previous category response, plus: 1. Increase source reduction and larvicide efforts. 2. Consider increased mosquito collections & testing, particularly of human-biting mosquitoes. 3. The decision to use ground-based adult mosquito control will depend on critical modifying variables including the time of year, mosquito abundance and proximity of virus activity to at-risk populations. 4. Intensify public education on personal protection measures: Multimedia messages Special messages for areas with vulnerable populations Increased advisory information provided on pesticides
5	High	More than 1 confirmed human case associated in time and place In the event of Risk Category 5, a Public Health Emergency may be declared pursuant to RSA 107 C:5.	Incorporates previous category response, plus: 1. Consider broader geographic adult mosquito reduction activities, across town lines, including ground-based pesticide application. 2. Enhance risk communication about adult mosquito control. 3. Emphasize urgency of personal protection through community leaders and media, and emphasize the use of repellent at visible public events. 4. DHHS will confer with local officials to discuss the use of intensive mosquito control methods.

Table 2. Guidelines for Phased Response to EEE virus Surveillance Data

Risk Category	Probability of human outbreak	Definition	Recommended Response
1	Remote	All of the following conditions must be met: 1. No prior year virus activity detected in a community or adjacent community. 2. No horse (non-human mammal) or human cases in current year. 3. Limited or sporadic current year EEE virus activity in birds.	1. Surveillance activities are routine. 2. Assess local ecology for mosquito abundance. 3. Routine collection and testing of mosquitoes. 4. Passive human and horse surveillance. 5. Emphasis on reducing mosquito breeding. 6. No EEE virus-specific supplemental control efforts are recommended.
2	Low	Areas anticipating EEE virus epizootic activity based on EEE virus activity in the prior year in the community or adjacent community. A risk category 2 condition exists if any of the following conditions are met: 1. Prior year virus activity: EEE virus mosquito isolates; 1 EEE horse (non-human mammal) case; no human cases, Or 2. Current year virus activity: EEE virus mosquito isolate identified in an enzootic mosquito species (e.g., <i>Culiseta melanura</i>); no horse (non-human mammal) or human EEE cases.	Incorporates previous category response, plus: 1. Assess mosquito populations, monitor larval and adult mosquito density. 2. Initiate source reduction; use larvicides at specific sources identified by entomologic survey and targeted at bridge vector species. May consider adulticiding. 3. Enhance passive surveillance of human encephalitis/meningitis and equine illness. 4. Expand community outreach and public education programs focused on risk potential and personal protection, emphasizing source reduction.
3	Moderate	A risk category 3 condition exists if any of the following surveillance indices are met in the community or adjacent community: 1. Prior year virus activity: confirmation of a human EEE case; or multiple horse (non-human mammal) cases, Or 2. Current year virus activity: multiple EEE virus mosquito isolates; or EEE virus isolated in mosquitoes most likely to bite humans; or EEE non-human mammal case, no human cases.	Incorporates previous category response, plus: 1. Increase larval control, source reduction, and public education emphasizing personal protection measures. 2. Actions to prevent disease may include targeted larviciding and possibly ground adulticiding targeted at likely bridge vector species. 3. Enhance human surveillance and activities to further quantify epizootic activity.
4	High	A risk category 4 condition exists if any of the following indices are met in the current year in the community or adjacent community: 1. Confirmation of an EEE human case; or 2. Multiple EEE non-human mammal cases; or 3. EEE virus mosquito isolation rates in an enzootic mosquito species (i.e. <i>Culiseta melanura</i>) are rising and the area of EEE virus activity is spreading.	Incorporates previous category response, plus: 1. These indices may trigger larviciding and/or adulticiding control measures. 2. DHHS will confer with local health officials 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. 3. Intensify public education on personal protection measures: Multimedia press release Special messages for areas with vulnerable populations Advisory information provided on spraying.

5	Critical	Risk category 5 condition exists if any of the following indices are met in the current year: 1. More than 1 confirmed EEE human case associated in time and space, or surveillance data indicating that multiple human cases of EEE are likely, Or 2. Multiple isolations of EEE virus from bridge vectors associated in time and space.	Incorporates previous category response, plus: 1. If risk of outbreak is widespread and covers multiple jurisdictions, DHHS will confer with local health officials and Arboviral Task Force members to discuss the use of intensive mosquito control methods. A Public Health Emergency may be declared pursuant to RSA 107 C:5. 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. The declaration of an emergency may trigger application of mosquito adulticide. DHHS will define targeted treatment areas for vector control following the declaration of an emergency. 2. Ground based ULV applications may be repeated as necessary to achieve adequate control. 3. Emphasize urgency of personal protection through community leaders and media, and emphasize use of repellent.
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