

THE STATE OF CONNECTICUT

**WEST NILE VIRUS
SURVEILLANCE &
RESPONSE PLAN**

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THE DEPARTMENT OF PUBLIC HEALTH
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Introduction

The West Nile Virus (WNV) Surveillance and Response Plan was developed by an interagency state working group led by the Department of Environmental Protection (DEP). The Department of Public Health (DPH), the Connecticut Agricultural Experiment Station (CAES), the Department of Agriculture (DoAg), the University of Connecticut Department of Pathobiology and Veterinary Science (UConn), and the Connecticut Association of Directors of Health also participated in this planning process. This report summarizes the conclusions of the working group and is used to guide the state's disease prevention activities. The West Nile Virus Surveillance and Response Plan has four key parts:

- Public Health Surveillance Activities to detect the presence and intensity of WNV activity in Connecticut.
- Mosquito Management Activities to reduce the threat of WNV in areas where the virus is most likely to reemerge.
- Communication and Public Awareness Activities to provide needed information to local officials, the public and the media in a timely manner.
- Public Health Actions to be taken if WNV is detected in Connecticut.

A summary of WNV activity in Connecticut in 2000 and the State's response can be found in the Annual Summary (see appendices). Background information on WNV and the prevention of mosquito-borne diseases can also be found in the appendices.

Connecticut Mosquito Management Program

In 1997, Public Act 97-289, "An Act Concerning Mosquito Control and Aerial Application of Pesticides," created the Mosquito Management Program to monitor mosquito breeding populations for the prevalence of infectious agents that can cause disease in humans and to determine when measures to abate any threat are necessary. The original focus of the program was to monitor the threat of Eastern Equine Encephalitis (EEE). The Act authorizes the necessary measures to abate any pest-borne threat, including prevention and remedial measures, and allows for the aerial application of broad spectrum chemical pesticides to address an imminent peril to the public health, safety, or welfare posed by pests, including mosquitoes that carry the EEE virus. The Mosquito Management Program is based on an integrated pest management (IPM) approach, which includes a combination of surveillance, education, source reduction, larval and adult mosquito control and personal protection measures.

The Mosquito Management Program is coordinated by the DEP. The DEP is responsible for the systematic identification and monitoring of mosquito breeding sites, the provision of technical assistance to municipalities and private property owners regarding mosquito control, and the collection and communication of information and data. The CAES is responsible for the trapping, identifying, and arbovirus testing of mosquitoes. The DPH is responsible for the surveillance of WNV infection in humans and in birds, for reviewing all surveillance data including mosquito test data, and consulting with the DEP and the CAES regarding the public health significance of such results. Based upon its evaluation of the potential human health risks, the DPH advises appropriate personal, municipal, and state actions to reduce such risks. The DoAg is responsible for the surveillance of WNV infection in domestic animals. The State Mosquito Management Team, consisting of staff from the DEP, DPH, CAES, and DoAg modifies, as necessary, the State EEE/WNV surveillance and response plans and reports to and advises the Commissioner of Environmental Protection regarding their implementation.

Public Health Surveillance Activities

Public health surveillance is the ongoing and systematic collection, analysis, and interpretation of health data in the process of describing and monitoring a health event. This information is used for planning, implementing, and evaluating public health interventions and programs. Surveillance activities are at the core of Connecticut's West Nile Virus Response Plan and include surveillance for WNV in mosquitoes, wild birds, domestic animals and poultry, and humans. The objectives of surveillance are to:

- Rapidly detect the occurrence of WNV and the extent of its geographic distribution.
- Determine whether transmission is occurring outside of the mosquito-wild bird cycle.
- Assess the potential threat to humans.
- Guide implementation of control measures.
- Obtain data to assess the risk of WNV infection to domestic animals and poultry and assess the need to develop a vaccine for domestic animals.

Mosquito Surveillance

With the identification of WNV in 110 towns in all 8 counties in 2000, the CAES will expand the network of mosquito traps. This new statewide network will provide critical information needed to assess the threat of potential human infection with WNV, including mosquito species composition and abundance in the community, seasonal and spatial distribution of mosquito vectors, and WNV infection rates in mosquitoes.

The CAES proposes to add 19 new trapping stations to the current 72 permanent sites. New stations will be located in communities where six or more birds tested positive for WNV or a horse was confirmed to have WNV infection, or where WNV-positive mosquitoes were found in 2000, and no existing trapping station is currently present. A listing of town sites is shown in Table 1.

Specific trapping locations (existing and proposed) within each community will be determined by late April after a field review of potential mosquito habitats and a review of 2000 data by CAES staff. Preference will be given to *Culex* habitat (i.e. watercourses, wetlands and parks) in urban areas where there is high public use and greatest potential for human exposure. As in 2000, the CAES will be prepared to place supplemental mosquito traps as necessary in areas where WNV may be detected in humans, horses, other domestic animals, or birds and no existing trapping stations are present.

Mosquito trapping will be conducted daily from June 1 through the end of October. Traps will be set and attended by CAES staff every 10 days on a regular rotation. Two trap types will be used at all trapping stations: a CO₂-baited CDC Light Trap, designed to trap host-seeking adult female mosquitoes (all species); and a Gravid Mosquito Trap, designed to trap previously blood-fed adult female mosquitoes (principally *Culex* species). Mosquitoes will be transported alive to the laboratory each morning where they will be identified on the date of collection. Mosquitoes will be grouped (pooled) according to species, collecting site, and date. A maximum of 50 female mosquitoes will be included in each pool.

Viruses will be isolated in Vero cells and identified in an enzyme-linked immunosorbent assay (ELISA) against specific reference antibodies to seven viruses known to occur in North America (WNV, EEE, Jamestown Canyon, Cache Valley, Highlands J, LaCrosse, and St. Louis encephalitis viruses), or by RT-PCR using virus-specific primers to these viruses. All of the virus isolation work will be conducted in certified Bio-safety level 3 laboratories at the CAES. Weekly test results will be reported to the DEP and DPH and released through the DEP Office of Communications. It is anticipated that complete processing of mosquitoes (from collection to virus isolation and identification) will require 8-10 days.

Wild Bird Surveillance

In 2001, the DPH will again coordinate the collection of information on bird mortality. Surveillance will include collecting reports of dead bird sightings of wild bird species, and the testing of selected species specifically for the presence of WNV. From May through October, local departments of health are requested to locally publicize the system and to compile and send weekly reports of sightings of dead birds in their jurisdictions to the DPH.

Because crows are particularly susceptible to WNV, crow deaths serve as an early indicator of WNV activity. Once the presence of WNV has been confirmed, crow deaths can be monitored quantitatively to help determine the level of risk to people. The testing of birds for WNV will continue to emphasize collection and testing of dead crows. Several other wild bird species that appear to be relatively susceptible to WNV infection (e.g., doves, jays, raptors, robins, and sparrows) will be collected and tested early in the season (May through July) in an effort to detect WNV in towns with smaller or diminished crow populations.

Once WNV is identified in a town and at least five wild birds are found to be positive, it will no longer be necessary to test more wild birds from the same town. At that point, we will discourage but not prohibit further submissions from that town; any additional submissions will be given lower priority for testing. Based on past experience, once dead crows begin to test positive for WNV, the percentage positive quickly rises to over 70 percent. Monitoring of WNV activity in birds at that stage will be done primarily through monitoring of the logs of dead wild bird reports and following the number of dead crow reports per square mile each week. Dead birds selected for priority testing will be transported by the DEP to UConn for necropsy and preparation of tissue samples for WNV testing at the DPH Laboratory. Local health departments will not be charged fees for transportation or for testing of birds submitted through this system.

The statewide bird mortality information, including density of dead crow sightings per square mile per week, will be compiled and summarized weekly by the DPH and disseminated by the DEP together with the mosquito trapping and testing information compiled by the CAES. With the availability of new testing methods, including RT-PCR, results on birds tested usually will be available within 10 days after pickup. The disposition of each bird submitted, including test results, will be posted on the DEP website as available. Each bird submitted will be identified by a unique number assigned by the DEP at the time the specimen is picked up. The initial positive specimens in a town will be reported directly by phone to the submitting health department by DPH.

Domestic Bird and Animal Surveillance

Because little is known about how WNV will affect the domestic animal and poultry populations, the United States Department of Agriculture (USDA) and the Centers for Disease Control and Prevention (CDC) have published joint guidelines emphasizing the national need for laboratory-based surveillance for neurologic conditions in domestic animals and birds with emphasis on horses. This surveillance provides another means to detect the presence of WNV and assess the risk of WNV infection to the human population.

The DoAg will investigate all cases involving domestic animals, poultry and pet birds with suspicious neurologic disease reported to the State Veterinarian and/or presented for necropsy and testing to the Connecticut Veterinary Diagnostic Laboratory at the University of Connecticut (UConn). Priority will be given to suspect equine cases presenting with at least one or more of the following clinical signs: apprehension (head shaking, inability to stand), depression (flaccid paralysis of lower lip, single or

multiple limb paralysis), or listlessness (ataxia including stumbling, weakness of hind limbs, paresis, acute death).

Protocols developed by the DoAg, UConn and USDA Veterinary Services will be followed to rule out other neurologic diseases such as rabies. If WNV is suspected after the initial evaluation, the animal or its specimens will be transported to UConn for necropsy and testing. Tissue specimens will be collected and analyzed by UConn for rabies. Additional tissue specimens will be submitted to DPH for rabies confirmation in cases where there is human or domestic animal exposure. Specimens [serum, whole blood, cerebrospinal fluid (CSF) and/or brain tissue] from rabies-negative animals will be submitted for further testing to determine the presence of WNV or EEE virus. Poultry and pet birds will be submitted to UConn for necropsy and preliminary diagnostic tests, and tested for WNV as appropriate. Passive and active sampling of domestic animals and poultry for serosurveys will be done as needed. UConn will retain and store specimens for retrospective studies and evaluation.

Human Surveillance

The surveillance for disease in humans caused by WNV is coordinated by the DPH. When WNV infection causes severe illness requiring hospitalization, it usually manifests itself as encephalitis or meningitis. In New York in 1999 and 2000, nearly two-thirds of the persons hospitalized with WNV infection had encephalitis; the remainder had meningitis. Thus, surveillance for encephalitis with testing for WNV appears to be a sensitive and efficient way to conduct surveillance for WNV infection in humans during periods of non-peak activity.

The DPH will review all cases of encephalitis reported by health care providers and hospitals. Acute samples of blood or cerebrospinal fluid taken from encephalitis patients will be tested for WNV immunoglobulin M (IgM) antibodies and for IgM antibodies to other arboviruses, particularly during the period of April through October. Convalescent samples will be obtained as needed.

During the peak human risk period for WNV (July-September), the DPH will contact acute care hospitals, in all areas of the state with WNV activity, to more actively identify patients diagnosed with encephalitis and with aseptic meningitis. Submission of acute blood or CSF specimens for free IgM antibody testing for WNV and other arboviruses at the DPH laboratory will be strongly encouraged on all suspect cases.

Encephalitis is a reportable disease in Connecticut. Because of the current importance of WNV, physicians and other health care providers are requested to report immediately by telephone any patient with a presumed diagnosis of viral encephalitis any time from April through September. Cases of viral encephalitis should be reported to the patient's local health department and to the DPH Epidemiology Program at 860-509-7994 during weekday business hours.

Free testing for WNV antibodies and antibodies to other arboviruses (EEE, California encephalitis group, St. Louis encephalitis, Jamestown Canyon) will be performed on appropriate acute and paired specimens submitted to the State laboratory. Although testing of paired specimens will provide the most accurate information, testing of acute specimens for WNV IgM antibodies is highly sensitive and will miss few cases. Convalescent specimens will not always be necessary to fully rule out WNV infection as a cause of severe neurologic illness.

Testing for WNV is not provided at the State Laboratory for persons suspected of having WNV infection on the basis of mild illness, such as fever or headache, and recent mosquito bites. Levels of WNV activity in the community would have to be very high (i.e., many confirmed cases of WNV encephalitis) for such symptoms to be likely due to WNV infection. In addition, as persons with mild illness will most

likely recover completely, testing is not necessary for prognostication. Rather than testing these persons, they should be advised to seek medical attention if more severe symptoms develop such as confusion, severe muscle weakness, lethargy, severe headache, stiff neck, or photophobia. For testing of outpatients, specimens should be submitted to commercial or hospital laboratories that perform testing for WNV antibodies or cross-reacting St. Louis encephalitis virus antibodies.

The DPH will also conduct surveillance for possible health effects of pesticide exposure. Physicians will be encouraged to report to the DPH Division of Environmental Epidemiology and Occupational Health any possible pesticide-related health effects. A standardized form will be used to collect data from the physician. The DPH will compile and summarize this information and report any significant findings back to the local health departments and other agencies as appropriate.

This physician-based reporting system will follow the National Institute for Occupational Safety and Health (NIOSH) classification of acute pesticide-related illness. Acute pesticide-related illness and injury is defined as being definite, probable, possible or suspicious as determined by the level of certainty of exposure, whether health effects were observed by a health-care provider, and whether sufficient toxicologic evidence supports a causal relation between the exposure and the reported health effects. When toxicologic evidence for an exposure-health effect relation is not present, the case is classified as unlikely.

The DPH will establish and maintain regular communication with the Poison Control Center. The DPH will monitor pesticide-related phone calls received by the Poison Control Center and disseminate information to local health departments and the DEP as warranted.

The DPH will establish a standardized intake form for use by local health departments to log incoming calls from the general public regarding health complaints. Local health departments will review and report any unusual clustering of complaints in terms of location or time to the DEP Division of Pesticides (See Appendix G: Important Phone Numbers) for investigation of possible misapplication of pesticide. Any resident who feels he/she has suffered or is suffering from a pesticide-related illness should be encouraged to see their physician.

Mosquito Management Activities

Mosquito control is the most effective way to prevent transmission of WNV and other mosquito-borne viruses to humans and other animals, or to control an ongoing outbreak. The most effective and economical way to control mosquitoes is by larval source reduction through local abatement programs that monitor mosquito populations and initiate control before disease transmission occurs. In addition, larval control allows for the use of target-specific agents in definable areas, which is an environmental benefit over other methods. These programs also can be used as the first line emergency response for mosquito control if disease is detected in humans or domestic animals.

In 2001, the DEP's mosquito management activities will include: assisting municipalities in developing larval control and homeowner source reduction strategies, disseminating information regarding personal protective measures and identifying mosquito breeding areas, and modifying habitat to eliminate sources of mosquito breeding.

The DEP will work with municipal officials statewide to identify mosquito-breeding habitat (e.g. tidal and inland wetlands, catch basins). The information collected on breeding habitat and sources will be shared with municipalities and used to develop larval control strategies. The data will enable the DEP to identify habitats that could be modified to reduce larval development. Long term control of mosquitoes can be achieved by using Integrated Marsh Management (IMM) techniques in tidal marshes. IMM alters

mosquito-breeding sites so they are unsuitable for egg and larval development and provides access to these sites for fishes that consume mosquito larvae and pupae. IMM also enhances wetland habitat for wildlife use.

Mosquito Control by Non-insecticide Methods

To reduce the risk of WNV infection, individuals need to take personal protective measures, and individual homeowners need to help reduce mosquito populations. Mosquito breeding on residential and commercial properties can be reduced significantly by reducing the amount of standing water available for mosquito breeding.

To prevent standing water, federal, state and local governments must maintain existing drainage structures on their properties such as sumps, recharge basins, sewage or wastewater treatment facilities, street catch basins, salt marsh ditches, upland streams, ponds, and pools (unless law dictates otherwise). Integrated Pest Management (IPM) strategies to eliminate larval mosquito breeding sites should be pursued. Privately owned or operated sewer facilities should be maintained in a similar fashion to eliminate larval mosquito breeding.

Municipalities collect and disseminate information on methods to control mosquito populations in their communities, coordinate mosquito control activities on public property, and work with state agencies on behalf of residents in their jurisdiction. Regulations relevant to mosquito control and the powers of local directors of health can be found in the Public Health Code (see Appendix F).

Mosquito Control Through the Use of Insecticides

Larvicides can be used to control mosquitoes in the aquatic stage before they become biting adults. This type of control using insecticides generally is the most effective at controlling mosquitoes and has the least effect on non-target species and the environment. The use of larvicides may require a permit from the DEP, and the product must be registered for use in Connecticut. Depending upon the type of product used, or for commercial applications, the applicator must be licensed by the DEP Pesticide Unit to apply mosquito pesticides.

Adulticides can be used to kill adult mosquitoes that may be infected with WNV. Currently available adulticides may be applied by hand-held, backpack or truck-mounted Ultra Low Volume (ULV) foggers, or by fixed-wing or rotary aircraft. These materials have advantages and disadvantages that will influence which material is most appropriate for a given situation, and all must be applied according to regulations and label directions.

In preparation for adulticiding (either ground or aerial application) the state will obtain the services of an aerial-spray contractor. Contractors will be in place for either ground or aerial ULV adulticide application by the state.

Factors affecting decisions to begin application of adulticide

When the decision to adulticide has been made, weather and logistical conditions may affect the ability of the applicator to effectively control adult mosquito populations. The following conditions and restrictions apply to adulticide application:

- Ground-level adulticiding will be done when mosquitoes are most active (between dusk and dawn).
- Aerial application will be done during daylight hours, under favorable weather conditions and at the discretion of the DEP and its aerial contractor.
- Wind speed will be less than 10-12 mph.

- Wind direction and temperature inversions will favor drift onto the target area.
- Air temperature will be above 50 degrees F.
- Adulticide applications shall not be made during rainfall.
- When making a ground-level application, the distribution and network of roads and access areas in the treatment zone will be considered, as this will affect the level of coverage.

State responsibilities before, during, and after adulticiding (either ground or aerial application)

- The DEP will determine boundaries for spraying in consultation with local officials such as chief elected officials, local health directors, police and fire departments, public works officials, local agriculture representatives, and other officials as appropriate. Consideration will be given to the flight range of any mosquitoes that tested positive, the density of the population and network of roads in the affected areas, the extent of traps in the area and the numbers and species of mosquitoes in those traps, and the use of global positioning and aerial photos.
- DEP officials will meet with the contractors to go over aerial photos and other geographic information to confirm logistics and boundaries for spraying.
- The DEP will issue public service announcements and press releases to inform the public of the areas to be sprayed with a minimum 24-hour notice. Public service announcements (PSAs) will include date, time, duration, and location of spraying; and precautions to take while spraying is occurring.
- The Mosquito Management Program will consult with any affected DEP programs, including Pesticides, Fisheries, State Parks, Inland Water Resources, and Conservation Law Enforcement.
- The State Office of Emergency Management may be activated to coordinate any public safety issues that may arise if aerial spraying is done.
- The DEP will collect reports from the public regarding the misuse or misapplications of pesticides. Persons who believe they have witnessed a misuse or misapplication of a pesticide should contact the DEP Pesticides Division at (860) 424-3369 from 8:30 AM to 4:30 PM, Monday through Friday. Outside of these hours, the public can contact the DEP 24-hour Emergency Dispatch Center at (860) 424-3333 to report pesticide misuse or misapplication.

Municipal responsibilities before, during, and after adulticiding (either ground or aerial application)

- Notify affected areas through local methods, which may include contacting residents through police and fire departments.
- Notify schools in the affected area in accordance with CGS Section 10-231c "Pesticide applications at schools without an integrated pest management plan" and CGS Section 10-231d "Pesticide applications at schools with an integrated pest management plan."
- Notify persons residing in the proposed spray area who are registered with the DEP Pesticide Unit's Pre-Notification Registry.
- Post signs in affected areas.
- Contact key local concerned citizen groups.
- Provide police escort and other logistical specifics.
- Field local resident's questions.

Communication and Public Awareness Activities

Public education about mosquito-borne diseases, particularly modes of transmitting and means of preventing or reducing risk for exposure, is a critical component of a prevention and control program. Communication and public awareness activities are designed to provide pertinent information both before and during the mosquito season. The goals of the communications and public awareness plan are to:

- Educate municipal officials, the public, and media on WNV, disease prevention recommendations including personal protective measures and homeowner source reduction, Connecticut's WNV Surveillance and Response Plan, and the use of larvicides and other control methods.
- Increase awareness among health care providers about the virus, its prevention and diagnosis, and information about pesticides.
- Communicate in a timely and efficient manner, with municipal officials, the public and other state agencies.
- Disseminate routine program information from state agencies to municipal officials, the public and media.
- Disseminate relevant information and recommendations to municipal officials, the public and media in response to the identification of WNV in Connecticut.
- Cooperate with key environmental organizations to review and disseminate public information materials.

State Outreach to Municipal Officials

- To enhance the knowledge of municipal officials (Local Directors of Health and Chief Elected Officials) before the onset of mosquito season, the DEP will conduct an annual training meeting with two separate program focuses. One part of the workshop will include the WNV surveillance activities in the state, WNV and associated health risks, public health action levels, and general communications and public outreach materials. The other part of the workshop will focus on the mosquito management program including techniques on mosquito reduction, larviciding, adulticiding, and pesticide use and risk. An overarching goal will be to train local health department staff to provide outreach to target audiences within their jurisdictions.
- The state will provide local health directors or town officials with a PowerPoint presentation on the WNV plan for use with the general public presentations.
- The DEP will make available to municipalities brochures, flyers, and fact sheets on mosquitoes, bird surveillance system, WNV, WNV health risk and food consumption risk, larvicides, pesticides, personal protective measures for people, and source control methods targeted at homeowners. This information will be made available in printed and electronic formats to chief elected officials, local health directors, selected businesses, key environmental groups, the general public and the Connecticut media.
- A revised WNV display will be developed incorporating the current CAES display and revised WNV materials. Several displays will be available for towns to set up at highly visible sites in their communities. The text can also be made available for towns to reproduce.
- Conference calls with local health directors will occur monthly and be organized by the DPH local health coordinator, and include all members of the State Mosquito Management Team. The monthly conference calls with state experts will be a forum to discuss current state and national information and actions.

State and Municipal Outreach to the General Public

- Municipalities will disseminate educational materials produced by the state and to the extent possible, provide outreach to target audiences within their jurisdictions.
- The state will organize a minimum of two regional public education meetings. Target audiences include the public, educators, nature groups and environmental groups. Topics will include mosquito reduction techniques, WNV surveillance system, WNV health risks, and ways to reduce risk from WNV. The DEP Office of Communications will select dates from April through September.
- The DEP will provide mosquito management information to the public, 24 hours a day, through a state Web site, and a telephone information line stating specific recorded information. DEP's

Information Phone Line and the linked web sites of DEP, DPH, CAES and DoAg will provide the most current information on local and state activities in affected areas, preventative measures and test results. The 24-hour Information Line telephone number is 1-866-WNV-LINE. Informational materials are available at <http://dep.state.ct.us/mosquito/index.asp>.

State Outreach When WNV Activity is Identified

- In the event of a positive isolation of WNV in mosquitoes, birds, domestic animals or humans in Connecticut or a neighboring state:
 - Municipal officials and local health directors in the towns affected will be notified directly by telephone by either the DEP or the DPH. Prevention and control measures will be discussed (see Public Health Action Levels).
 - The DEP will organize and coordinate a conference call with the appropriate state and local officials including officials from neighboring towns, as soon as possible. The purpose of this call will be to develop an action plan based on the Public Health Action Levels. The State will issue its disease prevention and control recommendations after municipal officials from the towns affected have been provided an opportunity for input and collaboration.
- Based on discussions with municipal officials in the towns affected, a series of public health actions will be taken and communicated to the public via the media (see Communicating with the Media). The DEP will produce press releases and written text for public service announcements to reflect the level of public health notification, and if any specific state action will occur. The state will make every effort to provide a minimum of 24 hours notice to the public for any ground-level low volume or aerial spraying of adulticides. The state will provide a limited number of signs to the town on details of the public health notification and alert status. The state will assist municipalities with key support information on responses to common questions from the general public.

Municipal Outreach When WNV Activity is Identified

- Provide direct notification to the targeted residential area where WNV has been confirmed.
- Place posters and signs of public health actions to be taken at key town locations.
- Address local resident's questions and concerns over specific town subjects.
- Set up information mechanisms to assist with public questions and be the first contact with the public in their community.
- Work with the state to define appropriate action if larviciding or adulticiding is recommended.
- Provide police or public works escorts if spraying does occur.

Communicating with the Media

- The DEP will coordinate all state media activities for the WNV surveillance and response plan. This will include daily media requests, editorial board meetings, op-eds and other press relations.
- Public Service Announcements (PSAs) will also be coordinated through the DEP. Two PSAs, (one 30-second TV and one 30-second radio), will be aired early in the season (June – ongoing). These PSAs emphasize preventative measures the public can do to reduce mosquitoes around their homes. Radio PSAs are also available in Spanish.
- Another set of PSAs, (two 30-second TV and one 60-second radio) will air if a positive isolate of WNV is confirmed in a mosquito pool or a public health alert is issued. These PSAs will target personal protective measures individuals can take to reduce their exposure to WNV and precautions to take during pesticide spraying. Radio PSAs are also available in Spanish.
- The DEP will be working with Connecticut and New York television and radio stations to secure prime airtime of the PSAs through co-sponsorship with the station. DEP will also be working with New York State Public Health Officials to coordinate public outreach campaigns when possible.

- The DEP will release test results for all surveillance activities (mosquitoes, wild birds, domestic birds, and domestic animals) beginning mid-May 2001 and continuing throughout the mosquito season. Test results will be released to the media weekly on Wednesday. If there is an immediate need to release information outside designated days, DEP will do so. All press materials will be faxed statewide to local health directors and chief elected officials.
- In coordination with local officials, the DEP will issue a press release when WNV activity is first detected in a town. The release may be delayed 24-hours to provide local officials time to prepare their response. Additional findings of WNV activity in a town will be reported by the DPH to the local health director as soon as available and will appear in the weekly summary tables released by the DEP. These additional findings of WNV activity may be directly released to the media by the local health director.
- Towns that have a positive WNV or EEE result will be responsible to release specific town contact information once they are notified of the results. The DEP will continue to provide both telephone information line and web page access to the test results and press releases.

Interagency Communication

- Regularly scheduled conference calls with the state mosquito management team will occur weekly and be coordinated by the DEP.
- The DEP will also coordinate dissemination of information regarding WNV and supplement communication by the DPH and CAES. Staff at the DEP, DPH, CAES, DoAg, and UConn will also be available to answer questions.

Important phone numbers and a glossary of terms related to mosquito control and public health can be found in Appendixes H and I.

Public Health Action Levels

If WNV is confirmed in Connecticut, the DPH, in consultation with other state and local agencies, will evaluate the potential threat to human health. Following evaluation of the data obtained from public health surveillance activities, the Commissioner of Environmental Protection, after consulting with the Commissioner of Public Health, will recommend that control measures be implemented in proportion to the threat of WNV infections in people. Each response level is described below along with the specific actions that will be undertaken.

Level I – Public Health Notification

A Public Health Notification will be announced when WNV is first detected and confirmed in a Connecticut town through bird, mosquito, or domestic animal surveillance. Confirmation of WNV will be based upon identification of WNV infection in tissue or mosquitoes, or serologic samples taken from birds, horses or other domestic animals.

The following actions will be taken when a Public Health Notification is announced:

1. Evaluate the need to expand mosquito trapping and to enhance human and bird surveillance both locally and beyond town lines.
2. Expand efforts to disseminate information on prevention and control methods to local health directors, elected government officials, and the public. The educational message should emphasize the importance of *Culex* mosquito breeding site reduction. Educational efforts in the area affected should also target older persons who are at increased risk for severe WNV illness and should emphasize the use of personal protective measures.
3. Evaluate the need for additional larviciding in the affected area and recommend additional applications as necessary.

Level II – Public Health Alert

A Public Health Alert will be announced in a town or contiguous towns when WNV is confirmed in:

- Multiple horses or domestic animals; or,
- Dead crow sightings of two or more per square mile in a week in a town; or,
- Two or more human-biting mosquito pools collected at one or more trap locations; or,
- Combinations of the above surveillance events; or,
- A person, without any other indication of the presence of WNV in the area, if it is likely that the person was infected in a specific area.

The following actions will be taken if a Public Health Alert is announced.

1. All actions in a Public Health Alert response will be initiated or continued and, in addition, if needed, information on adulticide applications will be disseminated. Additional emphasis should be placed on use of personal protective measures to minimize exposure to mosquitoes due to the higher risk of WNV transmission to humans.
2. The State Mosquito Management Team will conduct an evaluation of surveillance data from all sources in this and surrounding towns, the time of year, extent of previous larval mosquito control

activities, level of current mosquito activity, ability to thoroughly cover the area of risk by ground spraying, and weather conditions (see Mosquito Control).

3. Based on this evaluation, the Commissioners of Environmental Protection and Public Health, in consultation with local town officials, will consider and may recommend the ground application of adulticide to kill mosquitoes in the geographic area where WNV is thought to pose the highest human risk.
4. The application of adulticides by the State at this action level will be done only with the approval of the municipal officials in the towns affected.

Level III – Public Health Warning

A Public Health Warning will be announced when WNV is confirmed in a Connecticut town or contiguous towns:

- In a person with characteristic severe neurologic disease; and
- When in the judgment of the Commissioners of Environmental Protection and Public Health, evidence of the virus presents a serious risk to human health based upon high levels of WNV activity (e.g. two or more human-biting mosquito species in the area of concern test positive for WNV).

The following actions will be taken if a Public Health Warning is announced:

1. All actions in a Level II response will be continued or initiated; and in addition;
2. The Commissioners of Environmental Protection and Public Health will recommend the ground application of adulticide in the area affected when the Commissioner of Environmental Protection has determined that the application of adulticide is necessary to control mosquito vectors of human disease pursuant to CGS section 22a-54(e). The recommendation will be conditional and will be based on the evaluation conducted by the State Mosquito Management Team of surveillance data from all sources in this and surrounding towns, the time of year, extent of previous larval mosquito control activities, level of current mosquito activity, ability to thoroughly cover the area of risk by ground spraying, and weather conditions.
3. The Commissioners of Environmental Protection and Public Health will review the potential need for aerial application of adulticides after evaluating surveillance data from all sources in the area and surrounding towns, the time of year, current level of mosquito activity, the size of the affected area, the practicality of ground spraying of the same area and weather conditions.
4. The application of adulticides by the State at this action level will be done only with the approval of the municipal officials in the towns affected.

Level IV – Public Health Emergency

The Commissioner of Public Health may proclaim a Public Health Emergency, pursuant to CGS Section 22a-66l, when WNV is confirmed in a town or contiguous towns in Connecticut:

- In multiple persons with characteristic severe neurologic disease; and,
- When conditions exist that favor the continued transmission of WNV to people.

The following actions will be taken if a Public Health Emergency is proclaimed:

1. Continue or initiate all actions in a Level III response; and, in addition,
2. In accordance with the provisions of CGS Section 28-9, the Governor will evaluate the need for declaring a civil preparedness emergency;
3. After consultation with the Commissioner of Public Health, the Commissioner of Environmental Protection has the responsibility and authority to act unilaterally if the application of chemical pesticides from the air or ground is necessary to control mosquito vectors of human disease pursuant to CGS section 22a-54(e). Concurrent with this determination, officials from the Mosquito Management Program will meet with local officials in the affected communities to inform them of the situation and to discuss the logistics of spraying.
4. The application of adulticides by the State at this action level does not require the approval of the municipal officials in the towns affected.

Table 1. Mosquito trapping stations by town - 2000

County/Town	No. WNV Birds	No. WNV Mosquitoes	No. WNV Horses	No. Existing Trap Sites	No. Proposed Trap Sites	Total Trap Sites
Fairfield County						
Bridgeport	20			2		2
Bethel	6				1	1
Danbury	3		1		1	1
Darien	49			2		2
Easton	2			1		1
Fairfield	85	1		2		2
Greenwich	19	1		3		3
Monroe	8			1		1
New Canaan	37			2		2
Newtown	18		1	1		1
Norwalk	25	2		2		2
Redding	4			1		1
Ridgefield	12			1		1
Shelton	28	1		1		1
Stamford	125	4		3		3
Stratford	25			2		2
Trumbull	14			1		1
Weston	8			1		1
Westport	23	1		2		2
Wilton	18			2		2
Hartford County						
Farmington	2			1		1
Glastonbury	2		1		1	1
Hartford	17				1	1
Manchester	6				1	1
New Britain	8				1	1
Newington	19				1	1
South Windsor	10				1	1
Southington	26				1	1
West Hartford	41				1	1
Wethersfield	34				1	1
Litchfield County						
Barkhamsted				1		1

County/Town	No. WNV Birds	No. WNV Mosquitoes	No. WNV Horses	No. Existing Trap Sites	No. Proposed Trap Sites	Total Trap Sites
Canaan				1		1
Cornwall				1		1
Litchfield				1		1
Middlesex County						
Chester				1		1
Cromwell	2			1		1
Haddam	2			1		1
Killingworth	6			1		1
Middlefield	1		1		1	1
Westbrook	6				1	1
New Haven County						
Bethany	1			1		1
Branford	19			1		1
Cheshire	13		1		1	1
East Haven	3			1		1
Guilford	19			1		1
Hamden	7			1		1
Madison	4			1		1
Meriden	7	1			1	1
Milford	75	3	1	1	1	2
New Haven	23			1		1
North Branford	3			1		1
North Haven	6			1		1
Orange	13			1		1
Wallingford	15				1	1
Waterbury	5				1	1
West Haven	10			1		1
Woodbridge	5			1		1
New London County						
Franklin				1		1
Groton	7			1		1
Ledyard	3			1		1
Lyme	3			1		1
North Stonington	6			5		5
Old Lyme	19			1		1
Stonington	43			2		2
Voluntown				1		1

County/Town	No. WNV Birds	No. WNV Mosquitoes	No. WNV Horses	No. Existing Trap Sites	No. Proposed Trap Sites	Total Trap Sites
Waterford	7			1		1
Tolland County						
Hebron	1		1		1	1
Stafford				1		1
Tolland	3			1		1
Willington	1			1		1
Windham County						
Hampton				1		1
Plainfield				1		1
Windham				1		1
TOTALS:	1,028	14	7	72	19	91

**Appendix A: CT Mosquito Management Program Annual Report – 2000
(pending)**

Appendix B: Mosquito Protection for People Property and Pets (brochure)

**Appendix C: Personal Protection Against Mosquitoes - Using DEET
(brochure)**

Appendix D: West Nile Virus - Human Infection (brochure)

Appendix E: Pesticides and Mosquito Control - Using Adulticides (brochure)

Appendix F: Public Health Code Citations and Other Pertinent Regulations

The Public Health Code 2000 is a compilation of the regulations that pertain specifically to the Department of Public Health (pursuant to Section 19a-36 of the General Statutes of Connecticut). Regulations relevant to mosquito control and the powers of local health departments and the confidentiality of are listed below:

Environmental Health

19-13-B1. Conditions specifically declared to constitute public nuisances

The following conditions are specifically declared to constitute public nuisances:

- (a) Bakeries, restaurants and other places where food is prepared or served that are not kept in a clean and sanitary condition; or in which persons who have any communicable disease are employed; or for which suitable toilet facilities are not provided; or in which there is evidence that rats, mice or vermin are present.
- (b) Spoiled or diseased meats, whether exposed and offered for sale or being transported or kept for sale.
- (c) Barns or stables, hoggens, chicken yards or manure piles or accumulations of organic material so maintained as to be a breeding place for flies.
- (d) The discharge or exposure of sewage, garbage or any other organic filth into or on any public place in such a way that transmission of infective material may result thereby.
- (e) Privies not screened against flies in populous districts and privies likely to pollute the ground or surface water from which water supply is obtained.
- (f) Transportation of garbage, night soil or other organic filth except in tight, covered wagons which prevent leakage or access of flies.
- (g) ***Stagnant water likely to afford breeding places for mosquitoes within a residential district or within a distance of one thousand feet therefrom.***
- (h) Bone boiling, fat rendering establishments, or tallow or soap works, or other trades, when they can be shown to affect public health or produce serious offense.
- (i) Buildings or any part thereof which are in a dilapidated or filthy condition which may endanger the life or health of persons living in the vicinity.

19-13-B2. Abatement of nuisance

- (a) Any local director of health, upon information of the existence of a nuisance or any pollution occurring within his jurisdiction, or when any such nuisance or pollution comes to his attention, shall, within a reasonable time, investigate and, upon finding such nuisance or pollution exists, shall issue his order in writing for the abatement of the same.
- (b) Such order shall specify the nature of such nuisance or pollution and shall designate the time within which such abatement or discontinuance shall be accomplished; and if such order is not complied with within the time specified, the facts shall be submitted to the prosecuting authority. Copies of all orders shall be kept on file by the director of health in his office and copies of the same shall be furnished the state commissioner of health on request.

19-13-B31. Stagnant water

No person shall maintain or permit to be maintained any pond, cesspool, well, cistern, rain barrel or other receptacle containing water or accumulation of stagnant water in such a condition that mosquitoes may breed therein or may injure health or cause offense to other persons.

Regulation of Pesticide Use

Both state and federal statutes regulate pesticide use in Connecticut. The state and federal statutes require users of pesticides to adhere to the directions provided on the product's label. Any deviation from the label's directions is a violation of law. The label is the law.

Chapter 441 of the Connecticut General Statutes, the Connecticut Pest Control Act is the governing state statute. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended by the Federal Environmental Pesticide Control Act (FEPCA) of October 1972 and the FIFRA Amendments of 1975, 1978, 1980, 1988, and 1996 is the governing federal statute.

The DEP Division of Pesticides, PCB, Underground Tank & Terminal registers distributors of restricted use pesticides; processes permit applications for pesticide and herbicide applications; and certifies and oversees activities of pesticide applicators

Appendix G: Important Phone Numbers, Websites and E-Mail Addresses

Department of Environmental Protection

<http://dep.state.ct.us/mosquito/index.asp>

- *Latest test results, public information, brochures, PSAs* **1-866-WNV-LINE** (toll free)

* Mosquito Management Information Line **(860) 424-4184**

- *Latest information on test results, spray locations, protective measures*

* Communications Division **(860) 424-4100**

- *Mosquito testing results, state mosquito control policy and programs, media inquiries*

* Non-harvested Wildlife Program **(860) 675-8130**

- *Request by local health departments for pickup and testing of dead birds, WNV infection in other wildlife*

For local health departments to request pickup of birds **WNVCROWS@po.state.ct.us**

* Wetlands Habitat and Mosquito Management Program **(860) 642-7630**

- *Technical questions regarding mosquitoes, mosquito control measures*

* Division of Pesticides, PCBs, and Underground Tanks **(860) 424-3369**

- *Technical questions regarding safe pesticide use and chemical make-up. Also, persons who wish to be specifically notified prior to a pesticide application or those who are chemically sensitive to pesticides should contact the Pesticide Pre-Notification Registry at this number.*

Department of Public Health

<http://www.state.ct.us/dph/>

* Epidemiology Program **(860) 509-7994**

- *WNV infections in people, laboratory testing of human specimens, surveillance of WNV in wild birds*

For local health departments to send dead bird sightings report log - fax to **(860) 509-7910** / e-mail to **randall.nelson@po.state.ct.us**

* Toxic Hazards Assessment Program **(860) 509-7742**

- *Effects of pesticides on people*

* Virology Laboratory **(860) 509-8553**

- *Technical questions regarding testing of human specimens from physicians, hospitals, laboratories*

Connecticut Agricultural Experiment Station

<http://www.caes.state.ct.us/>

* Main Number **(203) 974-8604**

- *Technical questions from local health departments regarding mosquito trapping and testing in their area*

University of Connecticut

<http://www.canr.uconn.edu/patho/>

* Pathobiology Department **(860) 486-4000**

- Inquiries from local health departments regarding testing of birds and other animals not included in the state surveillance system

Department of Agriculture

<http://www.state.ct.us/doag/>

* Office of the State Veterinarian

(860) 713-2505

- WNV infections in domestic animals, including livestock, poultry, and pets

Appendix H: Glossary of Terms

Related to Mosquito Control and Public Health

adulticide	a type of pesticide used to kill adult mosquitoes
arthropod	a group of animals that do not have a backbone such as insects, spiders, and crustaceans
assay	a laboratory test
avian surveillance	monitoring of the bird population for presence of a disease
Bacillus sphaericus	a bacterium; type of biological pesticide used to eradicate mosquito larvae in water (mosquito larvae die after ingesting this bacteria)
Bacillus thuringiensis var. israelensis (BTI)	a bacterium; type of biological pesticide used to eradicate mosquito larvae in water (mosquito larvae die after ingesting this bacteria)
catch basins	grates seen at street corners for water runoff
communicable diseases	illnesses due to specific infectious agents or their toxic products that can be transmitted from an infected person or animal to a susceptible host; either directly or indirectly through an intermediate host
Culex pipiens	species of mosquito, the primary known vector for West Nile virus, commonly found in urban areas; breeds in fresh but stagnant water such as backyard containers and storm drains
DEET	DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products
encephalitis	inflammation of the brain, which can be caused by numerous viruses, including West Nile Virus
etiologic agents	biologic organism or chemical material that cause disease

gravid traps	type of mosquito traps designed to attract pregnant female mosquitoes
IgM-capture enzyme immunoassay (EIA) testing	a laboratory analysis for the presence of Immunoglobulin M antibodies (antibodies that rise during the acute phase of an illness and are a sign of recent infection)
indirect IgG enzyme immunoassay (EIA) testing	a laboratory analysis for the presence of Immunoglobulin G antibodies (long-lasting antibodies; their presence are a sign of past infection)
larvae	immature mosquitoes; stage which hatches from the egg, prior to adult stage
larvicide	a type of pesticide used to eradicate immature mosquitoes (larvae)
meningitis	inflammation of the lining of the brain and spinal cord which can be caused by a virus or a bacteria
methoprene	a type of larvicide; chemical that is used to prevent mosquito larvae from emerging and developing into adult mosquitoes
migratory birds	birds that fly south for the winter and return north in the spring
mosquito breeding site	a location where mosquitoes lay eggs, usually in stagnant water with organic material
mosquito pools	a group of mosquitoes collected in one area and combined at the laboratory for testing for the presence of West Nile and related viruses
N,N-diethyl-meta-toluamide	DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products
necropsy	autopsy on an animal
outbreak	an unexpected increase in frequency or distribution of a disease
overwintering	a period of rest or hibernation by which insects survive the winter

pesticide	substance used to kill pests such as insects, mice and rats; insecticide is a form of pesticide
pyrethroid	a synthetic complex organic compound with insecticidal properties similar to pyrethrins
resmethrin	a synthetic pyrethroid pesticide used to eradicate adult mosquitoes in the home, lawn, garden and at industrial sites; active ingredient in the product Scourge
salt marsh	areas of vegetation in bodies of salt water that may support the breeding of certain types of mosquitoes such as <i>Aedes sollicitans</i> ; examples of salt marshes are Stratford Great Meadows and Hammonasset State Park
serologic	of, or relating to serum
serum	liquid portion of the blood containing proteins, including antibodies
vector	an organism (an insect in most cases) capable of carrying and transmitting a disease-causing agent from one host to another
vector control	mechanism instituted to control and reduce the vector population
vector surveillance	monitoring of the vector population for presence of a disease
viral	of or relating to a virus
viral encephalitis	inflammation of the brain caused by a virus