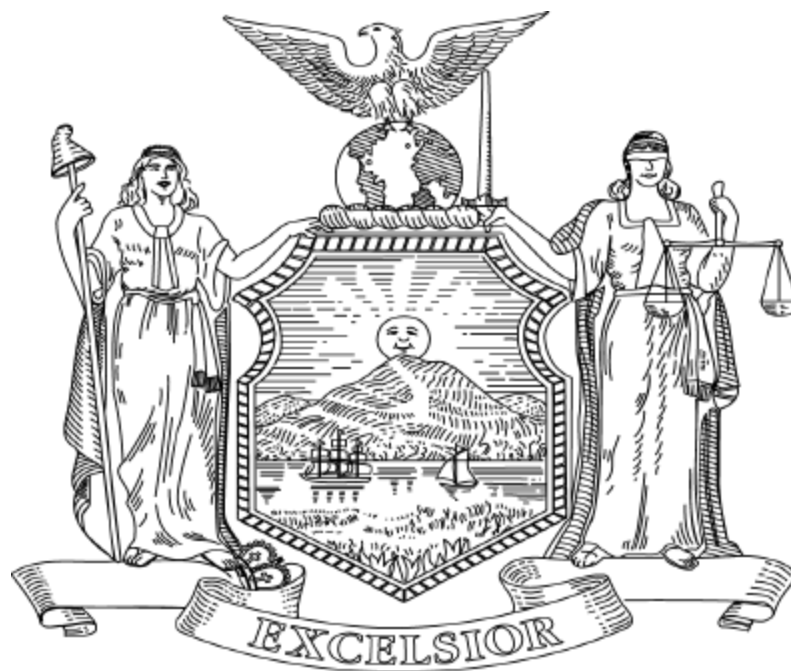


**NEW YORK STATE  
WEST NILE VIRUS RESPONSE PLAN  
– GUIDANCE DOCUMENT**



**New York State Department of Health  
May, 2001**

## Introduction

This document is the 2001 plan that the New York State Department of Health has developed by working in conjunction with other state agencies, local health units, and the Centers for Disease Control and Prevention to minimize the impact of West Nile virus in New York State.

This plan is a guidance document for local health units and other governmental agencies. It does not direct local health units to take particular actions. Rather, it describes those steps that, at this time, are considered to be most effective in protecting public health and the environment. Because our understanding of West Nile virus, while growing, remains incomplete, changes to the plan, as new information is acquired, are anticipated.

The outbreak of West Nile virus encephalitis in the New York City metropolitan area in the summer and fall of 1999 was an unprecedented event. After the initial outbreak in 1999, it was not certain if the virus had run its course or if the cycle of infection would begin again when mosquitoes emerged from hibernation. To prepare for its possible recurrence, New York State organized a series of work groups in the winter of 1999-2000, which included representatives from New York State agencies, local health departments, New York City officials, and representatives from community, environmental and other non-governmental organizations. The result of that effort was the 2000 *New York State West Nile Virus Response Plan*; the Plan emphasized surveillance, public education, and a hierarchical response for the management of mosquitoes.

Not only did West Nile virus persist through the winter, the virus spread rapidly throughout New York State and the northeastern United States in the summer and fall of 2000. By the end of the mosquito season, all but one county in New York State had documented West Nile virus activity. Fourteen New York City residents were hospitalized due to West Nile virus infection. In addition, West Nile virus infection was confirmed in 1,263 birds, 366 mosquito pools and 26 mammals.

After the 2000 outbreak, the New York State Department of Health reconvened the work groups to revise its response plan and to incorporate the valuable lessons learned during the past mosquito season. The result is the following revised plan, which includes five major sections: prevention, response and control; mosquito surveillance; bird and mammal surveillance; human surveillance; and public communications. Important changes from the previous plan are highlighted in the beginning of each section.

This plan is based on the realization that control measures are unlikely to eradicate West Nile virus from New York State. Therefore, the goal is to prevent amplification of the virus to the extent that it places humans and domestic animals at risk of serious illness. Evidence from human serosurveys that were conducted in 2000 showed that the risk of human infection and illness is quite low, even when West Nile Virus is present in the environment. It appears that humans are at greatest risk of serious illness in areas of extraordinary amplification of West Nile virus as a result of transmission among birds and mosquitoes. Therefore, this plan is based on

the approach of conducting careful surveillance to detect when West Nile virus is present and increasing, and then to conduct a graded response appropriate to the level of human threat. As the threat increases, the public health response changes from public education campaigns, mosquito larval habitat reduction programs, and larval control, to higher levels of education and enhanced larval control activities. Mosquito adulticiding is reserved for those situations where there appears to be imminent risk to human health.

Implementation of this plan will require the dedicated cooperation and participation of local, state and federal agencies, community organizations, and the public. With a coordinated response, the overall goals of this plan will be achieved by minimizing the risk of West Nile virus illness in humans and domestic animals through use of a graded response that causes the least adverse impacts on the environment.

## Acknowledgements

The development of this New York State West Nile Virus Response Plan could not have been possible without the hard work of innumerable staff of the New York State Department of Health and of many other local, state, and federal agencies and private citizen groups. Staff of the following groups are specifically acknowledged for a significant role in developing this plan:

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Erie County Department of Health  
Essex County Public Health Department  
Fordham University  
Genesee County Public Health Department  
Grassroots Environmental Education  
Monroe County Health Department  
Nassau County Department of Health  
Nassau County Department of Public Works  
National Audubon Society  
Natural Resources Defense Council  
New York City Department of Health  
New York State Association of County Health Officials  
New York State Department of Agriculture and Markets  
New York State Department of Environmental Conservation  
Niagara County Health Department  
Onondaga County Department of Health  
Ontario County Community Health Services  
Putnam County Health Department  
Rockland County Health Department  
St. Lawrence County Public Health Department  
Saratoga County Public Health Nursing Service  
Suffolk County Department of Health Services  
Sullivan County Public Health Nursing  
Ulster County Health Department  
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Westchester County Department of Health  
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**NEW YORK STATE  
2001 WEST NILE VIRUS RESPONSE PLAN**

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## Abbreviations

ABDP	Arthropod-Borne Disease Program
ARL	Arbovirus Research Laboratory of the Wadsworth Center
CDC	Centers for Disease Control and Prevention
CSF	Cerebrospinal fluid
DID	Division of Infectious Disease, Wadsworth Center, New York State Department of Health
EEE	Eastern equine encephalitis
ELISA	Enzyme linked immunoassay
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
HIN	Health Information Network
HPN	Health Provider Network
ICR	Initial case report
IGRs	Insect Growth Regulators
IPM	Integrated Pest Management
LHU	Local Health Unit
NAS	National Academy of Sciences
NVSL	National Veterinary Services Laboratory
NWHC	National Wildlife Health Center
NYSACHO	New York State Association of County Health Officers
NYSAg&Mrkts	New York State Department of Agriculture and Markets
NYC	New York City
NYCDOH	New York City Department of Health
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PRNT	Plaque reduction neutralization tests
PSA	Public Service Announcement
RT-PCR	Reverse transcriptase polymerase chain reaction
SLE	Saint Louis encephalitis
ULV	Ultra low volume
USDA	United States Department of Agriculture
WNV	West Nile Virus
WPU	Wildlife Pathology Unit of the New York State Department of Environmental Conservation
WS	Wildlife Services, United States Department of Agriculture

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# Prevention, Response and Control

## I. Introduction

West Nile virus (WNV) is a member of the Japanese encephalitis complex of flaviviruses, transmissible by mosquitoes, and can cause febrile, sometimes fatal human illness. West Nile virus was first isolated in Uganda in 1937 from a febrile woman and was subsequently isolated from other human patients, birds and mosquitoes. It has a wide geographic distribution and has been involved in human disease outbreaks in Africa, southwest Asia and Europe. Until 1999, this virus had never been reported in the Western Hemisphere. Mosquitoes, primarily bird-feeding species, are the primary vectors of WNV, although virus has been isolated from other bird-feeding arthropods, including some tick species. The natural transmission cycle of the virus involves a bird-mosquito cycle, but may include a bird to bird cycle or a tick-bird cycle where soft ticks (argasids) or hard ticks (ixodids) are found feeding on reservoir birds. The urban cycle of the disease requires species of mosquitoes (sometimes called bridge vectors) that will feed on free-ranging or domestic birds and people and other mammals.

The unprecedented introduction of WNV into the metropolitan area of New York City (NYC) in the late summer of 1999 and its subsequent statewide expansion in 2000 has resulted in a large-scale review of existing programs and required resources to address this threat. Representatives from local health units (LHUs), State and Federal agencies have been meeting on a regular basis to address each of the significant surveillance and response issues associated with this mosquito-borne disease. As a result of these discussions and consultation with community groups, the New York State Department of Health (NYSDOH) has developed a set of complementary action plans designed to offer a degree of consistency in the approach taken among municipalities to minimize cases of this or other related arbovirus infections.

Public health agencies should conduct surveillance to identify the presence of mosquito breeding areas, mosquito species, and mosquito-borne disease agents, and be prepared to intervene using a variety of methods to reduce further circulation of such disease agents in nature. Agencies should be prepared to use four fundamental approaches toward the management or control of these mosquito-borne agents: education, larval habitat source reduction, larval mosquito control and adult mosquito control, in that priority. This hierarchical approach from education, habitat modification, to control when required, should provide the best integration of strategies to assure the public's health. This plan describes a variety of steps to mitigate against a recurrence of the WNV outbreak and to assist the public health community to focus available resources on disease prevention. The plan will change as new scientific information becomes available. Therefore, recommended protocols will need to evolve with that new information.

### Highlights of Plan Changes for 2001

- West Nile Virus is acknowledged to be in every county of New York State.
- Removal of the four-tiered county hierarchy system.
- Replacement of the Decision Matrix in the 2000 plan with the NYS Suggested

- Guidelines for Phased Response to West Nile Virus Surveillance Data (Appendix A).
- Addition of Considerations for Adult Mosquito Control (Appendix B).
- Modification of State Aid Reimbursement Table (Appendix C).

## **II. Objective**

To use a hierarchical response and control approach to minimize the chance of human and domestic animal disease due to West Nile virus or other arboviruses.

## **III. Implementation Plan**

### **A. Develop Prevention Strategies to be Implemented by Governmental Agencies**

Prevention strategies should be based on a well planned, area-wide Integrated Mosquito Management (IMM) based program. IMM includes surveillance, education, source reduction, and larval and adult mosquito control. Surveillance and education issues are discussed in the following chapters of this plan.

The foundation of any mosquito-borne disease control program includes mosquito population reduction, through source elimination and larval control, and an educational campaign. Risk of human disease may be reduced by prevention in an IMM-based control strategy. IMM can be cost-effective even in years when no disease agents are detected. When source reduction or larval control is not possible or has reached its maximum but insufficient potential, adulticiding either by ground or air, may be required to suppress populations of infected mosquitoes. This approach, however, is reactive in nature, and can result in the exposure of people and the environment to relatively broad-spectrum pesticides. Limiting mosquito populations before they become biting adults provides a margin of safety, should a pathogen be introduced into an area. In addition, larval control allows for the use of target-specific agents in definable areas, an environmental benefit over other methods. Individual homeowners can help reduce mosquito populations, but to be effective, additional mosquito management may need to be undertaken on an area-wide basis by trained personnel. An integrated mosquito control program will require the cooperative efforts of all levels of government.

### **B. Develop Integrated Mosquito (Larval and Adult) Management Protocols**

This plan is based on a hierarchical response for municipal management of mosquito-borne virus. The plan identifies circumstances that may be present in any given municipality, and the types of activities that may be considered by the LHUs implementing comprehensive public health measures to control arboviral disease agents. Appendix A presents guidelines for use by the LHUs based on new surveillance data and the more detailed actions that may be conducted by the LHUs.

Environmental assessments are overarching activities that LHUs should initiate to begin to define the variety of environmental conditions that are present in the county, including areas that may support populations of mosquitoes (e.g., natural or man-made

wetlands areas, abandoned swimming pools), environmentally sensitive areas that need to be protected, areas that may require surveillance to identify the potential breeding of immature mosquitoes, and areas that need to be excluded from any chemical-based mosquito control program. The NYSDEC has background information on the environmental assessment process. Disease risk assessments go a step further to consider the likelihood of human exposure to mosquitoes, to *Culex* mosquitoes specifically, to areas that may have already documented virus activity or areas that appear likely to support large numbers of *Culex* mosquitoes in the absence of intervention.

## **C. Interpret Surveillance Data**

### **1. Use of Bird/Mammal Surveillance System Data**

Bird and mammal surveillance data should be used by state and local agencies and institutions responsible for disease control along with surveillance data from human case reports, human surveillance testing, and mosquito testing. Some specific recommendations for use of bird/mammal surveillance data include the following:

- If an increase in the density of dead crow sightings (number of dead crow reports per square mile) is noted, increased active surveillance for human cases, and mosquito and crow testing should be undertaken.
- Laboratory confirmation of WNV in any bird or mammal is one of several types of surveillance information that should be used as one indicator of the presence of WNV in a geographic area and the potential need for increased vector surveillance and vector control activities.
- In interpreting the evidence of the laboratory positive bird or mammal for concluding the presence of WNV in a geographic area, the following considerations should be included:

What are the probabilities of false positives and false negatives with the specific laboratory test used?

- Does the laboratory test and/or clinical history support the infection being current rather than from a prior years' exposure?
- Is there evidence that the positive bird or mammal acquired the infection locally, or was there a travel history or concern about migration such that the infection could have been acquired elsewhere?
- Is the positive bird or mammal from an area near the identified outbreak, or did it jump over a geographic area not previously identified as having WNV?
- Is there other supporting evidence of WNV in or near the geographic area, such as positive mosquitoes or human cases?

## Use of Mosquito Surveillance System Data

In addition to human, bird or other animal surveillance systems employed by LHUs and other institutions, mosquito surveillance data can provide invaluable information in an effort to understand the complex virus cycle in nature. In fact, consideration of any mosquito control operations requires a concurrent effort to identify the mosquito species distribution, density and dynamics, so that targeted control efforts are directed to specific habitats, at a specific time, and in a specific formulation to best result in effective and efficient mosquito control. Some specific recommendations for the use of mosquito surveillance data include the following:

- Municipalities that have had historical evidence of virus activity should monitor the larval and adult mosquito populations to allow determination of effective timing and location of insecticidal and non-insecticidal control efforts.
- If a municipality receives reports of multiple dead crows and the county-level dead crow density is increasing to levels of concern for a risk of human cases, the LHU should take action to establish, or enhance existing adult mosquito collections in the area and laboratory testing to help determine whether a zone of local virus transmission exists.
- Adult mosquito surveillance and laboratory testing should be immediately established, if not already in place, in residential areas in proximity to suspect horse or human cases of arboviral illness, especially in the absence of relevant case travel history.
- Larval and adult mosquito surveillance can be used to document control efficacy. Identical collection efforts should be conducted in the target intervention (spray) area as well as in a similar habitat not subject to the intervention (non-spray, or “control” area). In addition, pre- and post-intervention population assessments should be made in both areas.

### **D. Implement Mosquito Management**

Mosquito management can be achieved by implementing one or a combination of the following, which are listed by category:

#### Mosquito Control by Non-insecticide Methods

##### 1. Residential/Commercial:

Most larval control work on residential and commercial properties should be done by the residents or owners themselves. Government agencies should advise them where mosquitoes breed, what mosquitoes look like, and how to prevent breeding.

Governmental agencies may provide assistance in conducting environmental sanitation efforts such as cleaning or flushing storm drains, removing tire piles, eliminating containers that may hold stagnant water, etc. Tools for public education include radio, TV, newspapers, pamphlets, schools, environmental organizations, etc.

Many species of mosquito, including those currently implicated in the WNV epizootic, lay eggs in standing water with an organic content. Therefore, property owners should be advised to:

- Remove standing water from pool covers, abandoned pools, spare or discarded tires, rain gutters, and any other vessel on the property that can hold water for a period of time.
- Introduce fish into ponds and marsh areas (residential/municipal). Some species of fish may require permits to be used, and regional Department of Environmental Conservation staff should be consulted when giving this advice to property owners.
- Consider the use of a mosquito-trapping device if other attempts at reducing the mosquito population on a property have failed.

2. Municipal control of mosquito larvae:

- To prevent standing water, federal, state and local governments should maintain the existing drainage structures on their properties such as preserves, sumps, recharge basins, sewage or wastewater treatment facilities, street catch basins, salt marsh ditches, upland streams, ponds, and pools (unless law dictates otherwise). IPM strategies to eliminate larval mosquito breeding should be pursued. Privately owned or operated sewer facilities should be maintained in a similar fashion to eliminate larval mosquito breeding.
- Municipalities should be responsible for advising the towns and villages of what they can do to prevent mosquito breeding, and to enlist any support they may be able to provide toward the overall effort.

3. Avoidance of adult mosquito bites by the general public:

- The public should be advised to install screens on windows and doors of homes and commercial buildings.
- It is not necessary to limit any outdoor activities, unless there is evidence of mosquito-borne disease and you are encouraged to do so by your local health department. If the WNV is identified in an area, the public should be advised of the following precautions they may choose to take to try to reduce the risk of being bitten by mosquitoes:
  - Minimize time spent outdoors between dusk and dawn.
  - Wear shoes, socks, long pants, and a long-sleeved shirt when outdoors for long periods of time, or when mosquitoes are most active.

- Consider using mosquito repellent, according to directions, when it is necessary to be outdoors.
4. Avoidance of adult mosquito bites by outdoor workers
- It should not be necessary to change standard work health and safety practices outdoors, unless there is evidence of mosquito-borne disease and you are encouraged to do so by your local health department.
  - If the WNV is identified in an area, workers should be advised of the precautions that they may choose to take to try to reduce the risk of mosquito bites:
    - Wear shoes, socks, long pants, and a long-sleeved shirt when outdoors for long periods of time or when mosquitoes are most active (between dusk and dawn). Maintain body fluids to avoid heat stress.
    - Consider the use of mosquito repellent, according to directions, when it is necessary to be outdoors for long periods or at times when mosquitoes are most active.

Mosquito Control Through the Use of Insecticides (See Appendix B, Considerations for Adult Mosquito Control)

1. Larvicides can be used to control mosquitoes in the aquatic stage before they become biting adults. This type of control generally has the least effect on non-target species and the environment. The use of larvicides may require a New York State Department of Environmental Conservation (NYSDEC) permit, and the product must be registered for use in New York.

- Microbial larvicides such as *Bacillus thuringiensis* var. *israelensis* and *Bacillus sphaericus* can be used successfully in a broad range of freshwater habitats, but are somewhat unpredictable in salt marsh habitats.
- Biochemical larvicides (insect growth regulators - IGRs) such as methoprene can also be used in a variety of habitats, and are especially effective in salt marshes. While expensive, solid, time-release pellets and briquettes can provide sustained control in small areas, reducing labor costs. Sustained release methoprene products are not for use in known fish habitats.
- Monomolecular surface film products are available to control all aquatic stages of mosquitoes and can be used in polluted or artificial habitats, but should not be used where non-target insects are important resources. This eliminates most natural areas.

2. Mosquito adulticides should be considered the least desirable method of control and only used when current isolations of virus and/or evidence of disease has been established. Currently available adulticides include organophosphates, pyrethrins, and pyrethroid-based insecticides. These may be applied by backpack or truck foggers, or fixed-wing or rotary wing aircraft. These materials have strengths and drawbacks

that will influence which material is most appropriate for a given situation, and all must be applied according to NYSDEC regulations and label directions.

3. Fixed wing aircraft should not be disqualified as an option to apply insecticides should there be an epidemic of arthropod-vector disease. This method can apply the insecticide much more quickly to a wide area than other methods.
4. Effective methods to control overwintering mosquitoes in hibernacula need to be investigated, and, if appropriate, applied judiciously in established adult mosquito resting areas (*Culex* and *Anopheles* mosquitoes overwinter as adults).
5. If adulticides are used, either by land or aerial application, people may be exposed to them. Pesticide exposure carries some inherent risk to people. NYSDOH has considered what options are available to evaluate possible health effects from the spraying and has developed a surveillance plan that is included in this document.
6. The use of insecticides for mosquito control is accompanied by risks to non-target organisms and ecosystem function. Direct toxicity is the primary concern, and it may be reflected in fish or wildlife kills or in episodes of non-lethal effects which render exposed organisms susceptible to other sources of morbidity or mortality. Relative risks of the currently registered mosquito control pesticides, both larvicides and adulticides, have been described and are available on the NYSDOH website: [www.health.state.ny.us](http://www.health.state.ny.us).

#### **IV. Roles and Activities of the Local Health Units (LHUs), the New York State Department of Health (Regional and Central Offices), and State Department of Environmental Conservation**

##### **A. Local Health Unit Roles and Activities**

LHUs should conduct mosquito surveillance and control activities. State reimbursement for local surveillance and control activities will be based on NYSDOH approval of appropriate activities (Appendix C).

- A LHU control program should follow the IMM approach described earlier.
- The control program should also:
  - ensure that mosquito control personnel are certified to apply insecticides,
  - obtain all permits required for application of insecticides,
  - evaluate control efficacy.
- Municipalities and their contractors need to be aware of and implement worker protection requirements in NYSDOL law (Labor Law Articles 2 and 28) and regulations (12 NYCRR Part 820 and by OSHA 29CFR 1910).
- Municipalities should ensure that the public will be notified of any pesticide spraying schedules and locations within the NYSDEC notification time frames, and will also be notified as soon as possible of any changes to that

schedule. The public should be notified of a central telephone number within the municipality where calls may be placed for information.

- Municipalities should prepare, in advance, larval and adult mosquito control spray maps that delineate possible target and non-target areas, i.e., wetlands, sensitive sites, farmland and other features that could impact pesticide applications. This would allow all issues regarding which areas need to be avoided, which insecticides are appropriate and other restrictions to be settled before a health threat emerges.
- Municipalities should determine, in advance, what insecticides will be considered for use. As much as possible, each county should review the technical information to determine what choices they would have in various situations.
- Municipalities should review laws and regulations that must be adhered to such as:
  - Environmental Conservation Law Article 15 B Aquatic Pesticide Permits
  - Environmental Conservation Law Article 24 B Freshwater Wetlands Permits
  - Title 6, NYSDEC Regulation Part 190 B Temporary Revocable Permits B (This is normally covered as part of the Article 15 permit.)
  - Title 6, NYSDEC Regulation Parts 325-326 – Application and Registration of Pesticides
  - Title 6, NYSDEC Regulation Part 329 - Aquatic Insect Control Permits
  - New York State Public Health Law 611
  - NYSDOH Regulations Part 44 (10 NYCRR 44)

## **B. NYSDEC Roles and Activities**

- New York State Department of Environmental Conservation should:
  - Provide a listing of registered insecticide products in NYS that can be used for mosquito control.
  - Provide clearly understandable, practical limitations and restrictions pertaining to insecticide applications.
  - Process NYSDEC aquatic and/or wetlands permits for insecticide applications or wetland modifications (if needed).
  - Provide written templates for the use of *Bacillus sphaericus* and other appropriate larvicides for use as a guide by LHUs in preparing individual negative declarations.
  - Assist local government in compliance with relevant State environmental laws and regulations.
  - Assist other agencies in the development of technical guidelines for the use of adulticides, particularly aerial application.

- NYSDEC and NYSDOH should provide assistance to involved parties in determining the proper terminology to be used for public notification notices and releases.
- The NYSDEC/NYSDOH should have outreach staff to provide training and advise the municipalities on habitat reduction, personal protection, and insecticide use. NYSDEC pesticide staff could inspect application sites and provide support in registered products listings, guidance in following label directions, and assist with training and testing to certify pesticide applicators.
- NYSDEC has developed a manual entitled “Environmental Laws, Rules and Regulations Relating to Mosquito Control in NYS – Pesticide Use, Habitat Modification, Fish Stocking and Wildlife Collection” (available to interested agencies and others) which provides:
  - the category and training level needed by a certified pesticide applicator for each type of application,
  - a listing of the insecticide products (larvicides and adulticides) registered for use in New York.
  - a listing of the ingredients and food crop tolerances where they exist. (These are required if a pesticide application is to be made in a commercial agricultural area.)
  - regulations and permits required for pesticide applications.
 Information is also available on the NYSDEC website:  
[www.dec.state.ny.us/website/dshm/pesticid/pesticid.htm](http://www.dec.state.ny.us/website/dshm/pesticid/pesticid.htm)
- NYSDEC should commit to accelerated review of applications for registration of pesticides needed in control programs. The NYSDEC manual provides information on all state-registered products.
- Technical information has been developed for the commonly used larvicides and adulticides to assist decision-makers in choosing and using an insecticide. The information about the products that could be considered by decision-makers includes effectiveness under different environmental conditions (e.g., temperature), environmental fate, environmental risks, public health risks, costs, availability of the equipment and man-power, regulatory requirements, etc. Some of this information should be obtained by localities (i.e., costs, and availability of equipment and manpower). Information about registered pesticides, environmental risks, public health risks, environmental fate, and efficacy is available on the NYSDOH website: [www.health.state.ny.us](http://www.health.state.ny.us).

### **C. NYSDOH Roles and Activities**

- The New York State Department of Health should:
  - Provide staff to support LHUs with mosquito surveillance and control programs.
  - Provide consultation to LHUs regarding the appropriate response to the occurrence of WNV isolations or infections.

- Assist in the preparation of a brochure and other educational media on mosquito biology and control.
- The NYSDOH, in conjunction with staff of the LHUs, has identified the following training and technical needs for LHU staff:
  - Development and evaluation of comprehensive mosquito surveillance and control programs.
  - Evaluating adult and larval mosquito control activities.
  - Acquisition, management, and evaluation of mosquito surveillance data.
  - Understanding the state aid reimbursement process.
  - Compliance with state agency requirements.
  - Understanding options to increase public awareness and education about mosquitoes to promote personal responsibility supporting the prevention of mosquito breeding.
  - Identifying a local agency to assume responsibility for control activities including the availability of certified mosquito control personnel.
  - Developing a list of appropriate insecticides for use in mosquito control activities.
  - Identifying non-insecticidal techniques for mosquito control in sensitive areas.
  - Implementation of a response due to an outbreak of mosquito-borne virus activity.
- The NYSDOH should conduct a training program to address these needs, covering mosquito surveillance, mosquito identification and determination of control efficacy. This training program should commence in early spring and continue with the individual counties on an ongoing basis. A plan for addressing the technical needs of the counties (listed above) should also be developed.

# Mosquito Surveillance

## I. Introduction

Mosquito surveillance is an essential part of any mosquito-borne disease control program. As is true with the long-standing eastern equine encephalitis (EEE) surveillance program in New York State (NYS), any mosquito-borne disease surveillance system will require a commitment of personnel and equipment resources to understand the complex natural cycle of these viruses, their vectors and their natural hosts.

The NYSDOH has developed a comprehensive strategy to identify these issues and to build the foundation upon which thorough mosquito-borne disease prevention can be built. The following guidelines are built around scientific and technical information that may change over time, and therefore, the plan will require constant review and revision as new information becomes available.

### Highlights of Plan Changes for 2001

- Emphasis on initial mosquito surveillance and virus testing on *Culex* species in human population centers and high-use recreational areas.
- New **initial** statewide mosquito pool allocation for LHUs.
- Streamlined state aid applications/vouchers process.
- New logistics associated with LHU training.

## II. Objective

To determine the distribution and abundance of potential vectors of West Nile and other arboviruses, and to perform WNV testing of selected mosquito pools to detect the virus' presence in different geographic areas and species of mosquito.

## III. Implementation Plan

### A. Scope of Surveillance Activities

#### 1. Geographic Range of Surveillance

As a direct result of the 1999 and 2000 WNV outbreaks, high priority mosquito surveillance should be conducted in New York City (NYC), six Lower Hudson Valley counties (Dutchess, Orange, Putnam, Rockland, Ulster, and Westchester), and in Long Island (Nassau and Suffolk counties). All NYS counties should be offered training and consultation. The surveillance plan will remain flexible as municipalities develop new surveillance data, including virus isolations or evidence of virus exposure in animal hosts. Mosquito pool allocation will be

based initially on the distribution and density of WNV activity during 1999 and 2000, and will be subject to modification as seasonal surveillance information is generated.

## 2. Level of Surveillance

The primary purpose of mosquito surveillance is to determine the species composition, abundance, and geographic distribution of mosquito species within each county by collection of larval and adult mosquitoes. Adult mosquito specimens that are submitted for virus testing can also provide evidence of infection status. Counties will be provided program consultation and training as requirements and availability dictate. NYSDOH Program staff remain committed to all counties and should assist in surveillance efforts to the extent possible. In addition to the mosquito surveillance described in this section, LHUs may need to consider surveillance for other potential arthropod vectors and animals if these are determined to play a role in West Nile Virus or other arboviruses.

The action plan for mosquito surveillance includes:

- Mapping larval breeding sites using GIS technology based on aerial and ground-based surveillance methods.
- Establish presence of immature mosquitoes at breeding sites through the use of the standard aquatic dipper.
- Identifying potential vector species of WNV within each municipality through the collection of adult mosquitoes with miniature light traps baited with CO<sub>2</sub>, and CDC gravid traps or oviposition traps.
- Mapping distribution of vector species using GIS technology.
- Submitting potential vector species to NYS for virus testing. Current research indicates that initial efforts should focus on *Culex* species as primary enzootic vectors.

## 3. Regional/Within County coordination

- Municipalities should submit a weekly summary of mosquito activity to the NYSDOH. The summary will be on a standardized, electronic form on the Health Information Network (HIN). This information may be made available for distribution to the public.
- Local Health Units should develop an electronic mail or fax number list consisting of representatives of all their participating municipalities. NYSDOH and NYSDEC representatives should be added to this list. List members should receive weekly updates of mosquito activity throughout the region.
- Municipalities should participate in quarterly meetings to discuss surveillance results and control strategy.

## **B. Surveillance Activities**

The regional mosquito surveillance plan for WNV has been modeled after the eastern equine encephalitis (EEE) virus surveillance program that has been ongoing in NYS since 1984. Specific details of the regional surveillance activities are included in a manual developed by the NYSDOH Arthropod-borne Disease Program (ABDP). Surveillance activities include the location and mapping of larval mosquito habitats, adult collection techniques, and the handling of specimens for submission to the Arbovirus Research Laboratory (ARL) of the Wadsworth Laboratories for West Nile and other mosquito-borne virus processing. The ARL is able to process 400 pools/week for arboviral agents. Mosquito surveillance activities can extend from early May and last through September. Specimens for viral testing should be submitted weekly to the ARL starting the first week of June.

### **1. Larval Mosquito Surveillance**

Surveillance activities for immature (larvae and pupae) mosquitoes involve the location, mapping, and characterization of aquatic habitats (mosquito breeding areas). Mosquito breeding can occur anywhere standing water is available. Examples are numerous and include tires, drums, pails, garbage cans, plant pots, storm drains, unchlorinated swimming pools, or discarded appliances containing water. Mosquito breeding also occurs in natural water-filled areas not subject to wind or wave action. These areas may be temporary, flooded areas, tidal or fresh water wetlands, flooded depressions, or stream edges where quiet water pools exist, or in municipal sewage or wastewater treatment plants.

### **2. Adult Mosquito Surveillance**

Mosquito-borne viral pathogens in NYS may cause encephalitis in humans. EEE virus and WNV can also cause disease in an animal host. All involve wild animals, as non-clinical zoonotic hosts, and have unknown maintenance cycles with the exception of the California viruses which are maintained through transovarial and transstadial infection of the mosquito vectors. Infection in man occurs through the bite of an infected adult female mosquito. Thus, most vector surveillance activities are directed to the collection of this stage. Miniature light traps are considered the standard tool for surveillance of adult mosquito vectors. Lightweight and powered by four D-cell batteries, the trap is portable and can be used to sample a variety of adult mosquito habitats. For EEE virus and California viruses, these may be swamps and wooded areas. For WNV, the areas of concern are more urbanized. The trap collects primarily host-seeking female mosquitoes and the addition of CO<sub>2</sub> in the form of dry ice as an attractant substantially increases the collection of mosquitoes. Its use is generally recommended for routine surveillance activities for mosquito-borne viruses. Details for adult mosquito surveillance protocols are included in the NYSDOH Mosquito

Surveillance and Control Manual. Municipalities may also use the NJ light trap for mosquito population monitoring. This trap uses AC current and a standard 25-watt light bulb to collect adult mosquitoes. Since the trap is generally designed to kill the insects attracted to it, this type of trap, although good for monitoring species distribution and density, is not to be used for collecting specimens to be submitted for virus testing.

### 3. Mosquito Specimens - Laboratory Testing

Not all mosquito species are appropriate for arbovirus testing. Therefore, only pools of certain species should be submitted for testing. Target species for laboratory submission vary by disease pathogen of concern. For EEE virus, *Culiseta melanura* is the primary vector species. For WNV, members of the genus *Culex* should be given priority for testing, in particular *Cx. pipiens*, *Cx. restuans*, and *Cx. salinarius*, and species associated with *Culex pipiens* (*Ochlerotatus japonicus*, *Oc. triseriatus*, *Oc. cantator*, and *Aedes vexans*). Further protocol details are included in the NYSDOH Mosquito Surveillance and Control Manual. Mosquitoes should be grouped by species, site(s) and week of collection into a group, or “pool”, of 50 individual mosquitoes of the same species, collected by the same method during one week of collection activities.

The number of pools approved for testing from a municipality has been prioritized according to these criteria (in decreasing order of importance):

- (Highest) - Municipalities that had human and animal disease due to WNV.
- Municipalities that had animal disease due to WNV and WNV-positive vector mosquitoes, but no human disease.
- Municipalities that had only WNV-positive vector mosquitoes and birds.
- (Lowest) -Municipalities that had only WNV-positive birds.

Based on the above criteria, the following weekly pool allocation for municipalities conducting mosquito surveillance for WNV in the year 2001 is the initial allocation and is subject to weekly modification based on current surveillance data. The NYSDOH may consult with the CDC to arrange additional testing capacity if needed.

**2001 Initial Mosquito Pool Allocation for WNV Testing at Wadsworth:**

<u>Municipality</u>	<u>2001 Weekly Pools</u>
New York City	NA*
Nassau	40
Suffolk	40/NA*
Westchester	40
Rockland	40
Putnam	25
Orange	25
Dutchess	25
Ulster	20
Sullivan	10
Columbia	10
Central New York	70
Onondaga	
Madison	
Oneida	
Oswego	
All other counties, depending on surveillance activity	5 each
	<b>Total 400-470<sup>+</sup></b>

\* Jurisdiction plans to do its own mosquito testing in 2001.

<sup>+</sup> Total depends on number of counties conducting mosquito surveillance.

**IV. Roles and Activities of the LHUs and the NYSDOH**

**A. LHU Roles and Activities**

1. Municipalities requesting state aid under Article 6, Section 611 of the Public Health Law will submit state aid applications outlining their program objectives. Municipalities requesting state aid for *surveillance only* will file DOH 0627-2377 and municipalities requesting state aid for *surveillance and control* will file DOH 0627-2378 to the NYSDOH for review and approval. State aid applications will detail plans for surveillance or surveillance and control in terms of the objectives of the LHU in preventing human and animal arthropod-borne diseases. The application should be submitted prior to the start of the active mosquito surveillance season. State aid applications and materials may be obtained from Marie Miller, NYSDOH Office of Local Health Services, at (518) 473-4223. Further details about state aid are found in Appendix C.

2. The LHU should identify surveillance sites and provide the personnel, either internally or contractually, necessary to conduct the baseline mosquito surveillance and control program. This should include personnel needed to conduct larval and adult mosquito surveillance and personnel qualified and trained in mosquito control activities including the application of insecticides if desired by the LHU.

- Larval surveillance should include the location, mapping, characterization of mosquito breeding habitats, including use of GIS; the collection and identification of immature forms from larval habitats; and the determination of control options.
- Adult surveillance should include collection, sorting, identification, pooling and, if deemed warranted, submission of adult mosquitoes according to their weekly allocation for laboratory testing, including maintaining the integrity of specimens for laboratory testing.
- Record all data relative to mosquito surveillance activities.

## **B. NYSDOH Roles and Activities**

1. The NYSDOH ABDP staff should assist as requested in providing mosquito surveillance and laboratory specimen preparation. Depending on the number of LHUs requesting such assistance, this weekly support may need to be provided to several LHUs, thus diluting the quantity of data potentially obtained in any one LHU.

2. The NYSDOH ABDP will review state aid applications from municipalities conducting mosquito surveillance or mosquito surveillance and control activities. Review will include a determination of the appropriateness of the surveillance and control program to meet the stated goals and objectives of the LHU. Municipalities submitting incorrect or incomplete applications will be notified promptly so that corrected applications can be resubmitted in a timely fashion.

3. Comprehensive training for LHU mosquito surveillance personnel should be conducted by staff of the ABDP and other appropriate agencies. Training should occur at two times:

- a. Two similar four-day training programs in May/June 2001 will be held in Albany, Ithaca, and Buffalo to be attended by designated mosquito surveillance personnel from participating LHUs. Training offered includes basic mosquito biology; larval mosquito identification; guidelines for conducting immature and adult mosquito surveillance; and NYSDEC guidelines for pesticide use. LHU staff need attend only one of these

programs.

b. Two three- to four-day training programs in May/June 2001 will be held in Sullivan County and Ithaca to teach adult mosquito identification, sorting and pooling for laboratory submission; completion of collection and submission data forms and data recording; and preparation of adult mosquito reference collections. LHU personnel will bring fresh-caught adult mosquitoes to the training program each day.

4. At appropriate time intervals or at the request of the LHU, staff of the ABDP should provide on-site assistance to LHUs to maintain the scientific integrity of the mosquito surveillance program. Appendix D contains draft forms, prepared by the ABDP (and available on the HIN), for use by municipalities in recording and summarizing larval and adult mosquito collection data and submission of vector specimens. Included are:

- mosquito breeding habitat description form,
- weekly miniature light trap collection form,
- CDC gravid trap adult and egg raft form,
- laboratory submission summary form,
- summary of miniature light trap collections,
- mosquito/tissue laboratory submission form (this form is in development).

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## **Bird/Mammal Surveillance**

### **I. Introduction**

Dead bird sightings and laboratory testing provided the earliest indication of West Nile virus (WNV) activity in 2000. Other types of bird/mammal surveillance and testing were less useful for providing timely information about the geographical and temporal distribution of the virus. Thus, dead bird surveillance is recommended as a critical component of WNV surveillance in 2001. Other types of bird/mammal surveillance may provide additional useful surveillance information, and may serve critical research needs, but are not core WNV surveillance activities in NYS.

### **Highlights of Plan Changes for 2001**

- On a pilot basis for 2001, the U.S.D.A. Wildlife Services (WS) office in Castleton, New York will provide a toll-free dead bird reporting hotline as a new option for local health units (LHUs) to use to aid in the reporting of dead bird sightings.
- Mammal and live bird testing should continue to be available within resource limits as part of certain agencies' services or research, but will not be key components of WNV surveillance for the state.
- Positive test results will not be phoned to LHUs (except for all positive mammals and the first positive bird for a county of the season). New test results should be uploaded to the Health Information Network (HIN) by the Wadsworth Center daily at 1 p.m.
- Recommendations for the number of dead birds to submit for testing by season and stage of the outbreak have been developed.
- All birds received at the Wildlife Pathology Unit and the Wadsworth Center for possible testing should be entered into the Health Information Network (HIN) when received, even if the testing is not done, in order to help LHUs track specimens submitted.
- Additional summaries of data including real-time graphs of dead crow sightings and interactive maps should be developed, if feasible, for the HIN to track the outbreak and forecast human risk at the county level.
- Tracking of the possible risk for a human WNV outbreak is recommended using weekly dead crow sightings per square mile (dead crow densities), which will require reporting and entering dead crow sightings into the HIN during the week of the sighting.
- Increased emphasis on obtaining good locating information, including township and zipcode, should provide LHUs with more accurate forecasts of human disease risk.
- Bird species, other than American crows, are less specific for West Nile, and thus the sighting of a dead bird of another species may be less likely to provide an indication of WNV activity in the area. Thus, for reporting of dead bird sightings on the HIN, reporting of dead birds other than American crows is optional for LHUs. However, if birds of other species are submitted for WNV testing, the reports must be on the HIN.

## **II. Objectives**

- Prioritize surveillance activities in health departments for predicting risk of a human WNV outbreak.
- Emphasize and prioritize testing for the early identification of viral activity in a county over testing to verify continued viral activity later in the season. (Once viral activity has been confirmed in a county by testing, it is assumed to continue to the end of the mosquito season.)
- Optimize laboratory resources and speed up turn-around time by reducing the number of specimen submissions and by testing based on specific objectives.
- Continue successful components of year 2000 WNV bird/mammal surveillance:
  - Handle wildlife in accordance with state and federal licenses.
  - Collect all bird and mammal surveillance samples according to humane considerations and standard veterinary care guidelines.
  - Conduct dead bird surveillance and provide results to agencies and the public quickly enough for appropriate prevention and control activities to be undertaken.
  - Protect the confidentiality of individual bird/animal owners, veterinarians, and institutions submitting specimens.
- Encourage research into the impact of WNV on bird and mammals, and roles in the WNV disease cycle.

## **III. Implementation Plan**

### **A. All Bird and Mammal Surveillance Systems**

Although there will be differences among the types of bird/mammal surveillance systems in implementation and use, the following guidelines apply to all.

- NYSDOH shall provide data sharing infrastructure and training through the HIN for LHUs and through the Health Provider Network (HPN) for other state agencies responsible for WNV surveillance.
- NYSDOH should serve as a clearinghouse for WNV bird/mammal surveillance information and report requested information on dead bird sightings, specimens collected, and/or tested (denominator data), and positive test results (numerator data) to the Centers for Disease Control and Prevention (CDC), under the specifications provided in the CDC plan.
- NYSDOH's Wadsworth Center is able to provide WNV testing for authorized bird and mammal tissue specimens up to a limit of 200 tissue specimens per week for the entire state.
- The NYS Department of Environmental Conservation's (NYSDEC) Wildlife Pathology Unit (WPU) should process specimens received for WNV evaluation and evaluation of other causes of death as their research interests and resources allow, and provide any required reports to federal agencies.
- The NYS Department of Agriculture and Markets (NYS Ag&Mrkts) should coordinate surveillance for WNV in domestic animals (horses, cattle, sheep, goats,

- pigs).
- Cornell University's Diagnostic Laboratory should offer veterinarians WNV diagnostic services for clients' animals and coordinate additional WNV diagnostic work as requested by NYS Ag&Mrkts.
  - LHUs should maintain systems for receiving bird/mammal reports and for reporting to state agencies via the HIN.
  - USDA Wildlife Services (WS) will provide a toll-free Wildlife Services Dead Bird hotline between May and September as an option for LHUs and will enter all calls received to the HIN (unless a LHU has requested the calls be forwarded to the LHU).
  - The effectiveness of surveillance should be enhanced by collaboration with those groups and individuals most likely to find or come in contact with ill or dead birds and mammals, such as veterinarians, zoos, animal control, agencies whose employees spend considerable time out of doors (parks, wildlife, transportation, etc.), and members of birding and outdoor recreational organizations.
  - To maximize efficiency and share information for WNV prevention and control, all agencies with HIN or HPN access should use the data system for reporting and monitoring of surveillance data, and the secure discussion forum for questions about the bird/mammal surveillance processes.

## **B. Ill or Dead Wild Birds**

In conjunction with local and state partners, the NYSDOH should continue to place a high priority for WNV surveillance on information from ill or dead wild birds. This surveillance involves two components: a reporting system for sightings of ill or dead birds to track possible increases due to a reappearance of WNV and to monitor human risk level, and testing of selected ill and dead birds for verification of the presence of WNV in a geographic area. This surveillance system requires individuals seeing birds ill with neurologic signs or dead to make a report, including date and location information, to the LHU. Due to the high case fatality rate in American crows, and the statistical association of dead crow densities with human case risk, they should be prioritized for reporting and submission for testing, although inclusion of other species may help with early detection of WNV activity.

### **2000 NYS Data Analysis Findings: Submission Criteria for Testing**

- The American crow was the most sensitive species for avian morbidity/mortality surveillance. However, many areas with viral activity did not have positive American crows, but had only positive birds of other species, particularly if the area was more distant from the epicenter of the outbreak.
- Almost all of the positive birds were found singly, i.e., were not found as part of a mass die-off in a single time and place.
- Approximately a third of the positive birds had signs of trauma on necropsy.
- Many positive birds did not have indications of WNV on necropsy.
- No lesions on pathologic exam are pathognomonic for WNV, i.e., no specific lesions are absolute indications that a bird has WNV.

## **NYS and Surrounding Areas 2000 Data Analysis Findings: Dead Bird Surveillance for Monitoring Human Risk of WNV**

- Positive birds provided the first confirmation of viral activity in most areas.
- Positive birds always preceded human cases (although knowledge of the test results did not necessarily predate onset of the human cases).
- Counties with human cases tended to have higher dead bird surveillance indices, including those from positive birds and dead bird sightings.
- Some jurisdictions chose to modify surveillance protocols once the initial detection of WNV occurred.
- Dead bird surveillance findings were standardized for monitoring purposes by dividing the weekly number of dead crow sightings by the total square mile area of a county. The index retrospectively provided the best forecast for human risk. NYS used this index to classify three levels of risk for counties in 2000. The highest risk county (where most human cases occurred) reached an index of 1.5 more than one week prior to the first human case onset. This index is highly dependent on the level of effort expended in avian morbidity/mortality surveillance, and therefore is subject to sampling bias. Successful indices for reliable forecasting of human cases at a more local level than county have not yet been developed. The applicability of these results to future years or other geographic areas with different ecologies or bird species has not yet been determined, but shall be evaluated.
- Experimental evidence of direct transmission among crows (United States Geological Services-National Wildlife Health Center, unpublished data) may indicate an additional bias if this phenomenon actually occurs in nature.

### **1. 2001 Testing/Submission - anticipated priorities:**

- Birds from geographic areas without confirmation of viral activity in 2001.
- American crows.
- Other corvids such as blue jays and fish crows.
- Other species of interest to the WPU, NYSDOH, or LHUs, such as raptors (hawks, eagles, falcons), locally resident species (ruffed grouse), or threatened or endangered species.
- Hatch-year birds.
- Birds from areas with dead crow sightings (highest priority if weekly dead crow sightings per square mile is greater than 1.5; moderate priority if weekly dead crow sightings per square mile is between 0.1 and 1.5).
- Birds in good condition (do not submit deteriorated birds—birds with maggots, or crushed, or falling apart).
- Because birds with encephalitis are likely to fly into buildings or walk into roadways, birds with evidence of trauma may be submitted if still in reasonable condition.
- WNV does not usually cause group die-offs of birds, so dead birds found singly may be submitted. Birds from a mass group die-off (a large group of dead birds in a single place and time), particularly for non-corvid species (birds other than American crows,

fish crows, and blue jays), should not be submitted without prior consultation with the WPU.

- Because WNV does not always cause noticeable pathologic signs, birds without indications of typical WNV pathology on necropsy should also be considered for WNV testing.
- Although it is important to report dead crow sightings, not all dead birds will necessarily be tested for WNV depending on priorities and resources. Dead birds should not be submitted for WNV testing unless specific surveillance, research, educational, prevention, or control actions will be taken based on the results. Resources do not allow for WNV testing of dead free-ranging birds solely for the information of the individual submitter.
- When feasible, tissue banking with frozen and fixed tissue is recommended for further WNV histopathologic examinations and evaluation of the birds for other avian pathogens.

## **2. Modifications of surveillance and numbers submitted for testing by season:**

- It is recommended that the dead bird surveillance system be maintained year-round. However, for forecasting the risk of human WNV cases, the most critical time period is April through September.
- To avoid overloading laboratory resources and to provide general guidance for LHUs on sampling for laboratory testing, recommended numbers of dead birds to be submitted for WNV testing are provided below. Additional specimens beyond these limitations may be submitted year-round to the WPU for possible necropsy, with the understanding that depending on resources and priorities, the birds may never be processed, or may be processed and submitted to other laboratories than the Wadsworth Center for WNV testing with consequent longer turn-around times for results.
- If the specimens are of high priority but questionable condition, perhaps deteriorated, additional samples may be submitted in hopes of the laboratory receiving sufficient good quality specimens for testing.
- Approval from NYSDOH or the WPU is not generally required for submission of birds to the WPU for possible pathologic exam and subsequent WNV testing. If there is any question about the need for testing and testing priorities, the HIN/HPN secure discussion forum should be utilized to facilitate rapid secure dialogue and sharing of changing information about individual situations and priorities. LHUs with frequent questions relevant only for that county and its data may request separate three-way secure discussions to be established for the individual county, NYSDOH, and WPU only to facilitate private communications and data correction.
- Positive birds have been found in February, and April through November. Thus, it is recommended for monitoring purposes that LHUs submit one dead bird per week year-round, but should particularly make an effort to submit birds for testing between April and November for early detection of viral activity and determination of when viral activity has ceased in each mosquito season.

- *Prior to detection of WNV activity in a county*, it is recommended that LHUs increase submissions for testing to three or more birds per county per week, especially if: 1.) the weekly number of dead crow sightings per square mile exceeds 0.1; 2.) if surrounding areas have confirmed WNV activity; or 3.) the time period for confirmation of WNV activity in the county during previous years has passed.
- *After viral detection within a county*, it is recommended that the submissions for testing be reduced to two birds per county per week. In addition, the types of birds and specimens considered for testing can be more targeted and restricted (e.g., American crows, birds with pathologic signs) and limited to certain areas of the county (e.g., areas without previous viral detection or areas in which the results will be used for further surveillance activities or education, prevention, or control programs).
- Because mosquito activity and human cases are rarely documented beyond September, it is recommended that submissions for testing be reduced to one bird per county per week in October.

### **3. Recommended Activities of the Local Health Units, Department of Environmental Conservation, and the State Department of Health**

#### **Local Health Unit Activities:**

- Publicize the importance of reporting the sightings of dead crows. If a LHU wishes, it may instead publicize the importance of reporting the sightings of all ill or dead birds.
- Maintain a system for receiving reports of dead birds 24 hours per day, for example, with a telephone answering machine or public website for entering reports. However, alternatively LHUs may have an answering machine message directing callers to the Wildlife Services Dead Bird hotline.
- Whenever possible, efficiency and accuracy will be improved by having a “live person” taking dead bird sightings reports and entering information directly into the HIN while taking the report.
- If using a “non-live person” to receive the reports, it is critical that callers are either instructed to call back during office hours, or that instructions be provided on the answering machine or website for the type of information to be provided by the persons reporting the birds, including: instructions for bird preservation and where to keep them so they may be picked up if chosen by the LHU for submission, or where and when the birds should be dropped off; details to help identify the species (with an emphasis on distinguishing crows from other birds), etc.
- Geolocating information such as address, township and zipcode is critical for reports of dead American crow sightings and birds of any species that are submitted for possible testing.
- For HIN reporting, prioritize for data entry American crow sightings and birds of any species that are submitted for possible testing.
- When considering birds to submit for necropsy and testing, arrangements should be

made with individuals reporting the dead birds to obtain the bird within one business day of the original report to avoid sample decay.

- In order to monitor human risk with weekly dead crow sightings per square mile, crow-sighting reports should be entered or uploaded into the HIN the same week as the report is received by the LHU. Report forms are available on the HIN's West Nile Encephalitis Virus Home Page/Integrated Data Reporting Systems Page/Bird-Mammal.
- Arrange for either dead bird pickups for possible shipment for testing, and/or for places where the public or others desiring testing may drop off dead birds when authorized to do so by the LHU.
- Provide the public with information about safe handling of dead birds and other wildlife, including using gloves or grabbing the bird through a plastic bag to avoid skin contact.
- Purchase shipping containers to be used in sending specimens to the WPU (with containers to be returned by the WPU to the LHU after shipment).
- Ship bird specimens to the DEC WPU at its facility in the Albany area under guidelines promulgated by the WPU.
- Ship bird specimens with a tag provided by the WPU specific for 2001 and use the same preprinted number that is already on the tag to identify the bird for data entry on the HIN.
- If the bird has a high priority for necropsy and testing (based on indications provided elsewhere in this plan), this should be written on to the submission tag.
- Check the HIN each business day at 2 p.m. for new bird laboratory test results.
- If available, use the HIN generated graphs to monitor the number of dead crow sightings per square mile per week to help determine when viral activity may be increasing to sufficient levels for a possible human WNV outbreak.

#### **DEC Wildlife Pathology Unit Activities:**

- Provide submission tags preprinted with unique identifying numbers for LHUs to use when submitting birds.
- Provide guidelines to LHUs for shipping containers and shipping protocols.
- Indicate on the HIN when specimens are received from LHUs, prior to determination of whether the birds will be necropsied. If birds are received from agencies other than LHUs, create a new record on the HIN.
- Prioritize birds for necropsy and subsequent testing in conjunction with health agencies, using priorities listed above; emphasize new geographic locations, new species, areas of highest risk for human infection based on weekly dead crow sightings per square mile and other surveillance indicators, for those agencies using bird test results to make control decisions.
- Necropsy birds and submit appropriate laboratory specimens to Wadsworth for WNV testing as resources allow.
- Submit specimens beyond Wadsworth Center capacity to other laboratories such as the National Wildlife Health Center (NWHC), and enter submission status on the HIN.

- Enter necropsy results on the HIN.
- Provide periodic analyses and reports on species patterns and other information learned during pathologic exams.

**NYSDOH Wadsworth Center Activities:**

- Provide dead bird testing of up to 200 bird or mammal tissue specimens per week year-round if feasible, but particularly during mosquito season and/or periods with positive specimens in previous years (April-November).
- Upload information on all new specimens received (denominator data) and test results (numerator data) to the HIN by 1 p.m. each business day.
- Provide education about laboratory procedures and interpretation of laboratory test results.
- Conduct WNV research with birds as resources allow.

**NYSDOH Epidemiology Activities:**

- Provide specific protocols and guidance for surveillance activities.
- Provide updated text and summary maps each Friday for HIN and NYSDOH public website posting.
- Telephone the LHU with first positive bird report in the year on the same day the result is received from the laboratory.
- Report new surveillance results (numerator results daily and denominator data weekly) to CDC, and verify such data before inclusion in CDC summary reports, websites, and maps.
- Perform data monitoring and cleanup activities.
- Assist with data entry for those agencies without HIN access.
- Conduct epidemiologic analyses to assist in interpretation of data.
- Prepare annual summary reports.
- Coordinate planning activities.
- Answer inquiries through the HIN secure discussion forum.

**NYSDOH HIN Activities:**

- Develop, update, and maintain HIN surveillance forms and summary tables, graphs, and maps, in coordination with Epidemiology within resource limitations.
- The primary summary table should be numerator and denominator data by county.
- Develop summary graphs for weekly dead crow sightings per square mile, if feasible.
- Develop summary maps for WNV-positive birds (first priority) and dead crow sightings per square mile (long-range priority), if feasible.
- Insure that all HIN products protect confidentiality of data and restrict from the view of other counties the detailed locating and submitter information.
- Provide training in use of the HIN to reporting agencies.

### **USDA Wildlife Services Activities:**

- Maintain Wildlife Services Dead Bird hotline as an optional service to LHUs for dead bird reporting between May and September, 2001.
- Set up hotline, hire staff, and train staff for hotline.
- Provide backup procedures for receiving calls during off-hours.
- Develop clear instructions for callers about safely handling, storing, and/or disposing of dead birds not picked up for testing.
- Work with callers to identify species of bird sighted if possible to improve accuracy of HIN records.
- Collect detailed geolocating information on all dead bird sightings, even those that will not be considered for possible testing, including address and zipcode.
- To maximize usefulness of information for LHUs and to avoid birds decomposing while awaiting pickup, enter all bird sighting reports the same week (and preferably the same day) as received at the hotline.
- Develop clear information for the public that not all birds will be tested, that decisions about bird pickup for possible testing will be made at the LHU level, and that test results are utilized for local surveillance and cannot be provided directly back to the person reporting the dead bird.
- Record accurately the detailed location of the dead bird to save LHU time in pickup, by reducing need for calls between LHUs and the person reporting the bird to coordinate pickup.

### **C. Sentinel Bird Flocks**

For other arboviruses, sentinel bird flocks with serial monitoring of viral antibody levels have been an important surveillance tool. However, for WNV, an appropriate and sensitive species and surveillance system using sentinel birds has not yet been identified. Thus, it is recommended that appropriate agencies conduct research with various bird species in regard to routes of transmission, antibody levels, range of clinical signs, etc. Findings will help with understanding the role of various bird species in maintaining or accelerating the WNV disease process and whether any bird species can provide a safe and effective sentinel surveillance function through serial monitoring of serologic specimens. However, until research establishes the parameters under which sentinel flocks may be effective indicators of WNV, sentinel flocks are not recommended for NYS as a core surveillance activity in 2001.

### **Summary of previous studies:**

- Experimental studies have shown that chickens, pigeons and pheasants are safe sentinels. However, small amounts of WNV have been isolated from cloacal specimens, and thus virus may be shed in the feces. There is no evidence to date that this route of exposure has served as a source of human infection.
- Field studies of avian seroprevalence in Queens in 1999 indicated that captive chickens were frequently infected. In Staten Island in 2000, captive pigeons were

- frequently infected.
- Chickens were used as sentinels in 2000 in selected counties in NY, NYC, NJ, PA, MD and DE. Small numbers of seroconversions were detected late in the season in NJ, NYC and NY. Further research efforts are required to determine the potential efficacy of sentinel chicken surveillance for WNV.
  - Of more than one hundred sentinel chickens maintained in various locations in New York State, eight were positive for WNV.

#### **1. Advantages of captive sentinel bird surveillance:**

- There is a long history (> 6 decades) of the successful use of chickens in flavivirus (other than WNV) surveillance.
- Birds are readily fed upon by vector mosquitoes.
- Captive birds can be serially bled, and the geographic location of infection is not in question.
- The system is flexible and therefore can be expanded and contracted as appropriate.
- Mosquito-abatement districts, if established, can bear the responsibility for maintaining flocks, bleeding birds, and submitting specimens for testing.
- Laboratories with the ability to charge for testing may defray the expenses of testing by charging nominal fees per test.

#### **2. Disadvantages of captive sentinel bird surveillance:**

- Sentinel flocks detect only focal transmission, requiring that multiple flocks be positioned in representative geographic areas. This is particularly true when vector mosquitoes have short flight ranges (e.g., *Culex pipiens*).
- Flocks are subject to vandalism and theft, limiting usefulness in urban areas.
- Flocks must be protected from predators.
- Set-up and flock maintenance are expensive (e.g., birds, cages, feed, transportation).
- Training is required for proper maintenance and sampling.
- Pre-existing flocks may already be exposed due to previous local WNV transmission.
- More research is needed to validate the usefulness of sentinel captive birds for monitoring WNV transmission.

#### **D. Free-ranging sentinel birds**

The use of free-ranging live birds as sentinels provides the opportunity for sampling important reservoir hosts and may be used both for early detection and for monitoring virus activity. This type of surveillance has been used effectively for St. Louis encephalitis, Eastern equine encephalitis and Western equine encephalitis surveillance in several states. In each geographic area, the optimal species for serologic surveillance purposes should be determined by serosurveys. The best sentinels for serologic surveillance are those species in which infection is rarely if ever fatal.

Protocols for free-ranging sentinels are similar to that for other arbovirus surveillance.

Some jurisdictions may require institutional animal care and use protocols for this activity. State and federal permits are required. Serum or plasma can be used for serology and/or virus isolation.

Serologic testing of apparently healthy wild birds has indicated low WNV positivity rates early in the mosquito transmission season and higher positivity rates later in the season. Thus, it does not appear at this time that monitoring antibody levels in wild-caught healthy birds will provide an early warning of viral activity, in comparison to dead bird surveillance. However, as with sentinel flocks or groups, further research is recommended to understand infection rates, clinical impact, and the potential surveillance role of wild bird serologic testing. Priority may be considered for monitoring antibody levels of wild caught healthy crows in order to help determine the case fatality rate from WNV. Although various agencies will consider this type of monitoring for research purposes in NYS in 2001, it is not recommended as a core surveillance component for LHUs.

**Recent experience:**

- In urban epizootic transmission foci in New York City, several common species developed high seroprevalence, making them strong candidates for free-ranging sentinels (e.g., house sparrows, cardinals, catbirds, mourning doves), although other species may be important in other locations.
- High seroprevalence of important reservoir hosts (e.g., sparrows) in northeastern Queens in 1999 preceded low transmission activity in the same neighborhoods in 2000.

**1. Advantages:**

- There is a long history of successful use in flavivirus surveillance.
- Local movement of resident wild birds may allow contact with enzootic transmission foci, thus increasing sensitivity.
- Set-up or maintenance costs may be minimal.
- Highly flexible sampling capability is possible.
- High antibody titers are suggestive of recent infection.
- Evaluation of herd immunity among important reservoir hosts is possible.
- Owner confidentiality is not an issue.

**2. Disadvantages:**

- Interpretation is complex.
- Handling and venipuncture of reservoir species increases the risk of exposure to pathogens in feces and by accidental needlestick.
- Movement of free-ranging wild birds makes it impossible to know where the infection was acquired.
- Federal law protects most birds and possession requires state and federal permits.

- Banding permits require complex data reporting.
- Training is required for live-trapping, blood-sampling, handling and accurate determination of species and age of wild birds.
  - It is generally not feasible to serially bleed individual free-ranging birds because of low recapture rates, although banding can be useful.
  - Currently, serologic testing may require species-specific antiserum.
  - Some jurisdictions may require animal use protocols for this activity.

## **E. Wild Mammals**

In NYS, mammals that have died of encephalitis are more likely to have died of rabies than WNV, and rabies can be transmitted to people before those infected mammals die (unlike WNV that has no documented direct transmission between mammals and people). Thus, it continues to be critical that all mammals with neurologic signs, that have had contact resulting in possible rabies exposure to people, pets, or domestic animals be submitted for rabies testing to either the Wadsworth Center's Rabies Laboratory or the NYC Rabies Laboratory, according to the guidelines established by those laboratories. See Wadsworth Center's Rabies Laboratory website at [www.wadsworth.org/rabies](http://www.wadsworth.org/rabies).

For the 1999-2000 period, only seven wild mammals tested positive for WNV: in 1999, a New Jersey cat; and in 2000, a big brown and little brown bat in NY, a rabbit, chipmunk, and squirrel in NY, and a skunk in Connecticut. Wild mammals have not provided the first indication of WNV activity in any county or state, and are not recommended to be included as part of core surveillance activities.

### **Guidelines for WNV testing of dead wild mammals:**

- Testing should be conducted as resources permit by the Wadsworth Center as part of research protocols to understand the clinical course, incubation period, case fatality rate, impact on wildlife species, and usefulness for human surveillance.
- Although specimens may be submitted throughout the year, testing may be limited to slower times of the year (such as the winter).
- Additional testing may be available through laboratories other than the Wadsworth Center.
- All numerator (positive and negative) and denominator (number submitted for testing and number tested) data should be reported as indicated for dead bird surveillance through the HIN.
- NYSDOH Epidemiology should phone all positive results to LHUs.

## **F. Owned Animals (Domestic Mammals, Pets, Poultry)**

In NYS, there were 23 case-horses in 1999 and 21 in 2000. Horses in NYS were never the first indicators of viral activity in any county, although they were the first positive surveillance specimens for counties in some other states. In addition to horses, there was one positive cat in New Jersey in 1999. There have been 12 positive pet or captive birds (3

cockatiels, 1 parakeet, 2 peacocks, 2 snowy owls, 1 zebra finch, 1 domestic goose, 1 domestic turkey, and 1 ring-necked pheasant) and 4 positive dead chickens that were 'free-ranging' or from backyard flocks in NYS in 2000.

Both as a service to veterinarians and their clients, and to help advance research into WNV's impact on animals, Cornell University will continue to provide WNV testing for ill owned animals, as resources permit.

**Guidelines for WNV testing of ill owned animals:**

- Owned animals with neurologic signs should receive a veterinary evaluation and appropriate diagnostic testing, including both rabies and WNV, particularly if the animal is from a geographic area with identified WNV infection.
- If rabies is part of the differential diagnosis and potential human or other animal exposures have occurred, the animal should be humanely euthanized and rabies testing undertaken at the NYC or NYS Rabies Laboratory according to promulgated guidelines ([www.wadsworth.org/rabies](http://www.wadsworth.org/rabies)).
- If WNV is considered to be a possible diagnosis (based on potential exposures in a WNV infected area), acute and convalescent serologic specimens should be taken.
- Private practice veterinarians with questions about whether WNV testing is indicated for domestic animals (livestock) should contact the New York State Department of Agriculture and Markets (NYSAg&Mrkts) at 518-457-3502.
- Private practice veterinarians with questions about whether WNV testing is indicated for small animal pets should contact Dr. Amy Willsey, Assistant State Public Health Veterinarian, Zoonoses Program, NYSDOH, 518-474-3186.
- If resources allow, Cornell should test animals with neurologic signs free of charge; but a small fee (\$20-\$50 per type of test) will be charged for testing of asymptomatic animals because of client or veterinarian request.
- The United State Department of Agriculture, National Veterinary Services Laboratories, should be used as a confirmatory reference laboratory for New York's results as needed, within its capacity for testing.
- Information on sample submission for Cornell's Veterinary Diagnostic Laboratory is available at its website at <http://diaglab.vet.cornell.edu/> or by phoning (607) 253-3900.
- All numerator (test results) and denominator (number submitted for testing, number tested) data should be reported on the HIN.
- All numerator (test results) data should be reported by phone to the veterinarian and/or client by NYSAg&Mrkts for domestic animals (livestock) and by Cornell for small animal pets.

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# Human Surveillance

## I. Introduction

Although human illness in New York State (NYS) due to WNV was identified only in New York City (NYC) in 2000, WNV infected mosquitoes were found in 6 NYS counties in addition to NYC and WNV infected birds were identified in all but one NYS county. Currently, no clear predictors for the risk of human illness have been identified except for certain host factors such as age. Therefore, all local health units (LHUs), in coordination with NYSDOH, should enhance surveillance for West Nile virus infections to improve the ability to promptly detect a human outbreak.

### Highlights of Plan Changes for 2001

- Enhanced passive case surveillance is recommended for all counties from June through October. Active case surveillance is recommended for counties when there is evidence of WNV activity in their jurisdiction in 2001.
- The Viral Encephalitis/Meningitis Case Report Form (VEMCRF) has been modified into a single page format (Appendix D). This will replace the two-page form used in 2000.
- The LHU need not enter suspect case reports on the HIN or conduct follow-up on patients that clearly do not meet the case criteria for WNV, unless there is laboratory evidence suggestive of infection.
- Wadsworth does not routinely perform plaque reduction neutralization testing (PRNT) on specimens with indeterminate or positive WNV IgG antibody results until a second specimen is received.
- At least one commercial laboratory will be approved to conduct WNV screening testing (enzyme-linked immunoassay [ELISA]) on NYS residents in 2001. A positive ELISA result for IgM or IgG antibody to WNV is not diagnostically conclusive of WNV infection, due to extensive cross-reactivity with other flaviviruses. All positive specimens should be forwarded to Wadsworth for appropriate confirmatory testing.
- The LHU should complete and enter the VEMCRF data on the Health Information Network (HIN) and ensure submission of necessary specimens to Wadsworth for persons testing positive at a commercial laboratory.

## II. Objective

Enhance surveillance for suspected West Nile virus infections and improve the ability to promptly detect a human outbreak.

### III. Implementation Plan

#### A. Surveillance Guidelines for West Nile Virus Infection

All counties in NYS should implement **enhanced passive surveillance** for viral encephalitis and, as resources permit, viral meningitis and Guillain-Barre syndrome during the adult mosquito season (June through October). Jurisdictions with evidence of WNV activity in the 2001 mosquito season should consider implementing more active surveillance.

- **Enhanced Passive Case Surveillance** (*Recommended for all counties.*)

1. Surveillance should be conducted from June through October.
2. Broadcast facsimile alerts and/or mailings should be sent to all hospitals and select physicians regarding the:
  - a) Importance of reporting viral encephalitis and viral meningitis, and
  - b) Criteria and instructions for submission of appropriate laboratory specimens for WNV testing.

A template alert should be developed by NYSDOH and modified, as needed, by the LHUs. The initial alert should be followed by monthly updates to hospitals, with continuing reminders to report cases of viral encephalitis and viral meningitis.

3. LHUs should ensure that convalescent sera is obtained on all case-patients with either viral encephalitis or viral meningitis of unknown etiology if acute sera and/or CSF obtained <8 days after illness onset is negative for WNV. If resources are limited, patients with more severe clinical presentations (i.e., encephalitis) should be prioritized for follow-up specimens. (See Laboratory Testing for WNV.)

4. In April 2001, NYSDOH should contact the commercial laboratories licensed to conduct arboviral testing on NYS residents as a reminder of the need to report patients with positive arboviral serologies.

5. LHUs should initiate follow-up of commercial laboratory reports for sero-positive cases of WNV, St. Louis Encephalitis (SLE) and other arboviruses. Specimens should be re-tested by NYSDOH for WNV and other arboviruses by serologic (capture ELISA and/or plaque reduction neutralization tests) or viral assays to differentiate the likely etiologic agent.

- **Active Case Surveillance** (*One or more of the following options should be conducted*)

by counties if current WNV activity is detected in their jurisdiction.)

1. Active surveillance conducted at sentinel acute care hospitals.
  - a) Weekly contact with **key medical staff** (e.g., *infectious disease, neurology or intensive care subspecialists*) and/or the **infection control practitioner (ICP)** regarding hospitalized case-patients with suspected viral encephalitis or viral meningitis.
  - b) LHUs should ensure that appropriate laboratory specimens are obtained on all suspected cases and tested for WNV.
2. Laboratory-based surveillance conducted at sentinel hospitals. This system will provide back up to ensure that suspected viral encephalitis and viral meningitis cases that are not reported by clinicians are tested for arthropod-borne diseases.
  - a) LHUs should ask laboratory staff to store all spinal fluid samples that have parameters suggestive of a viral etiology (e.g. *increased protein, pleocytosis and negative gram stain and culture*).
  - b) Samples should be collected weekly and submitted to NYSDOH or NYCDOH and screened for arboviruses by IgM-capture enzyme linked immunoassays (ELISA) and/or reverse transcriptase polymerase chain reaction (RT-PCR) testing.
3. Retrospective surveillance conducted for patients discharged with a diagnosis of encephalitis/aseptic meningitis of unknown etiology.
  - a) LHUs should ask sentinel hospitals to search databases for patients discharged with select ICD-9 codes.
  - b) If additional patients are identified, hospital laboratory directors should be contacted to determine if serum or CSF is available on identified suspect patients.
    - If specimens are available, arrangements should be made for testing at NYSDOH or NYCDOH.
    - If specimens are not available, patients should be contacted to obtain convalescent sera.

## B. Recommended Criteria for Suspected Cases of West Nile Virus Infection

- **Any adult or pediatric patient with suspected viral encephalitis** (criteria a, b, and c below) with or without associated muscle weakness (criteria d):
  - a) Fever  $\mu$  38 ° C or 100 ° F, **and**
  - b) Altered mental status (*altered level of consciousness, agitation, lethargy*) and/or other evidence of cortical involvement (*e.g., focal neurologic findings, seizures*), **and**
  - c) Cerebrospinal fluid (CSF) pleocytosis with predominant lymphocytes and/or elevated protein and a negative gram stain and culture, **with or without**
  - d) Muscle weakness (*especially flaccid paralysis*) confirmed by neurologic exam or electromyography (EMG).
- **Any adult or pediatric (aged 2 years or older) patient with suspected viral (aseptic) meningitis** (criteria a, b, and c below):
  - a) Fever  $\mu$  38 ° C or 100 ° F, **and**
  - b) Headache, stiff neck and/or other meningeal signs, **and**
  - c) CSF pleocytosis with predominant lymphocytes and/or elevated protein and a negative gram stain and culture.
- **Any adult or pediatric patient with Guillain-Barre syndrome** (particularly individuals with atypical features such as fever, altered mental status and a CSF pleocytosis).

## C. Laboratory Testing for WNV

All suspect cases will first be reported to the LHU using the VEMCRF (Appendix D). LHU staff will screen reports to assess that the clinical presentation meets the case criteria for viral encephalitis or aseptic meningitis. If the case meets the surveillance criteria, the hospital or physician will be provided information on how to submit appropriate diagnostic specimens.

The NYSDOH Wadsworth Laboratory provides viral testing for WNV, including reverse transcriptase polymerase chain reaction (RT-PCR) testing, enzyme-linked immunoassays (ELISA) and plaque reduction neutralization tests (PRNT). Wadsworth Laboratory provides WNV RT-PCR testing through the Emerging Infections Encephalitis Project funded by the Centers for Disease Control and Prevention (CDC). This project includes

testing CSF specimens on patients with encephalitis of unknown etiology for 13 different viruses.

Appropriate specimens for testing include:

1. **CSF** – can be tested by IgM capture ELISA and RT-PCR

If there is **insufficient quantity of CSF for both ELISA and RT-PCR**, testing priority should be determined by the ordering physician.

- a) Capture ELISA is more sensitive than RT-PCR for WNV testing and should be considered when there is stronger suspicion of WNV than other etiologic agents.

- b) RT-PCR is less sensitive for WNV, but provides testing for 13 different viruses. This test should be considered if suspicion of the etiologic agent is stronger for viruses other than WNV.

2. **Serum** – Acute and convalescent sera can be tested by IgM Capture and IgG ELISA testing, with indeterminate and positive specimens confirmed by PRNT.

3. **Brain Tissue** – Can be tested by RT-PCR and viral culture.

- In the event that acute specimens (*obtained within 8 days of illness onset*) are negative by RT-PCR, or negative or indeterminate by ELISA testing, the LHU should obtain a follow-up (convalescent) serum collected at least 3 weeks after the acute specimen. LHUs should have the capacity to arrange for obtaining convalescent blood specimens on suspect case-patients who have indeterminate or negative initial results. If resources are limited, patients with more severe clinical presentations (i.e., encephalitis) should be prioritized for obtaining follow-up specimens.
- LHUs should work with hospitals and physicians to encourage testing for only those patients that meet the criteria for either viral encephalitis or aseptic meningitis. Patients with milder illness (*e.g., fever and headache, fever and rash, fever and lymphadenopathy*) or no symptoms (*e.g., person with recent mosquito bite but no acute symptoms*) do not need to be tested for WNV. Since WNV testing is now available for NYS residents by commercial laboratories, physicians providing care to individuals who do not meet the surveillance criteria can be referred to these laboratories.
- Physicians and laboratories should complete all essential information on VEMCRF, including clinical and risk factor data, symptom onset and specimen collection dates. The LHU should obtain and update essential missing information on patients that are or have been hospitalized and/or meet the surveillance criteria.

#### D. System for Data Flow and Information Sharing for Human Surveillance

- The physician will complete the VEMCRF on a patient that has viral encephalitis or viral meningitis (Appendix D). The physician will fax the form to the LHU where the case-patient resides and mail the form with the clinical specimen(s) to Wadsworth.
- If the case meets the surveillance criteria for WNV or data is missing to make that determination, the LHU should enter the data from the VEMCRF form into a secure, confidential site on the HIN as a suspect WNV case. Some LHUs (e.g., NYCDOH) may opt to enter data into a separate database and arrange to have batch file exchanges with the HIN. LHUs that do not report communicable diseases through the HIN should fax or mail the form to the NYSDOH Statistical Unit for data entry on the HIN.
- If the case does not meet the surveillance criteria for WNV, but meets the criteria for a different reportable disease entity or syndrome, the case should be reported according to usual communicable disease reporting protocols.
- If the patient clearly does not meet the surveillance criteria for WNV or any other reportable disease, no further follow-up is required. If subsequent laboratory results of these patients suggest infection with WNV, then appropriate follow-up should be conducted by the LHU (*e.g., collecting additional clinical or risk factor data or obtaining convalescent specimens*).
- When NYSDOH receives the clinical specimen(s), the type of specimen and date received should be entered on the HIN. If the data from the patient's VEMCRF form has not been entered on the HIN by the LHU, NYSDOH should initiate a suspect WNV case report by entering all of the VEMCRF data if (1) the patient meets the WNV surveillance criteria, (2) information is missing to make that determination or (3) the patient is/has been hospitalized or hospitalization status is unknown and does not meet any other communicable disease case definitions. All other reports will be mailed to the LHU on a weekly basis.
- NYSDOH should ensure that data on lab results are entered into the HIN on patients tested for WNV. The database section for the laboratory results should have a field that will notify the LHU that convalescent sera is needed to determine WNV case status if the initial test is non-diagnostic.
- NYSDOH should review the database regularly to look for errors, missing variables, duplications, etc.
- LHUs should be notified by NYSDOH of all new positive WNV human cases before sharing non-confidential information with other jurisdictions.
- NYSDOH should maintain up-to-date summary maps of all positive cases on at least a weekly basis.

#### **IV. Recommended Roles and Activities of the NYSDOH and LHU**

##### **A. NYSDOH Roles and Activities**

- Develop and/or update surveillance materials (*including template physician alerts, instructions for specimen collection and submission, forms for requesting laboratory testing, case investigation forms*).
- Prioritize WNV serologic and virologic testing on all suspected viral encephalitis and viral meningitis cases, especially during the adult mosquito season from May through October.
- Initiate suspect WNV communicable disease (CD) reports on the HIN for case-patients who meet the surveillance criteria for WNV infection and who have clinical specimens submitted to Wadsworth, but who have not been reported by the LHU on the HIN.
- Ensure timely sharing of laboratory test results for WNV on the secure HIN site.
- Provide timely summary data on human surveillance activities in NYS.

##### **B. LHU Roles and Activities**

- Implement enhanced passive surveillance in June 2001 and continue through October 2001.
- Conduct active surveillance in areas with current WNV activity.
- Coordinate all WNV case surveillance activities, including tracking suspect case reports (*hospitalized patients or patients meeting the WNV surveillance criteria*), ensuring submission of appropriate specimens to NYSDOH or NYCDOH, obtaining missing data (*e.g. onset and collection dates, clinical syndrome*) on the initial case report form and completing the WNV case investigation forms for all positive cases.
- Develop the capacity to ensure that convalescent sera is obtained on suspected cases of WNV infection that test negative on acute specimens obtained within eight days of illness onset to definitively determine the presence or absence of WNV as the etiologic agent.
- Check the HIN on a regular basis for new suspect case reports or new laboratory specimens received at the lab.
  1. Communicable Disease Reporting System (Encephalitis, West Nile) contains all ICR data and a link to the laboratory data.

2. WNV Human Linelist lists all laboratory specimens submitted and results for WNV testing to date.
- Maintain and update HIN databases for case-patients in the local jurisdiction to track local surveillance reports.
  - Provide medical outreach and consultation to physicians in the local jurisdiction regarding WNV encephalitis reporting and testing.

# Surveillance of Possible Health Effects from Pesticide Exposure

## I. Introduction

The plan for controlling the transmission of WNV is to use a tiered approach, starting with education, mosquito habitat reduction, larvicides, and adulticides in that order. There are limited opportunities for human exposure to larvicides. If adulticides are used, either by ground or aerial application, people may be exposed to them. Also, the threat of viral transmission may result in greater-than-average use of repellents or individually applied pesticides. Pesticide exposure carries some inherent risk to people. This risk can result from the active ingredients or the carrier agents. If the pesticides are applied properly, it is expected that most people would not experience health symptoms. However, some people may be particularly sensitive to certain pesticide products or their carriers, which may include petroleum solvents. Such individuals could experience short-term, temporary effects such as skin, eye or mucous membrane irritation, as well as exacerbation of conditions such as asthma. Therefore, monitoring of possible health effects is important.

Many signs or symptoms that might be related to pesticide exposure are non-specific and could be confused with other conditions or caused by other exposures. Also, individuals with symptoms may not seek medical care, and the provider may not associate symptoms or conditions with pesticide exposure. Thus, surveillance of possible health effects cannot provide a comprehensive accounting of all outcomes. However, it is prudent to monitor the nature and extent of concerns and common outcomes to verify that no severe, unanticipated health effects are occurring.

## II. Objectives

- To review data as it becomes available to help identify any potential acute health effects associated with pesticide use that might require immediate investigation and response.
- To retrospectively assess collected data to help identify possible health effects of pesticide exposure.
- To assess year 2000 and 2001 surveillance results to determine if ongoing surveillance activities should be continued in the future and, if so, at what level.
- To determine the feasibility and usefulness of evaluating possible asthma exacerbations around the time pesticides are applied. The New York State and New York City Departments of Health are analyzing asthma reports during the 1999 outbreak to evaluate this activity.

## III. Activities

During the mosquito control season, the NYSDOH should collect information on calls received reporting health symptoms possibly related to WNV-related adulticide applications. In addition, the NYSDOH should contact agencies (Local Health Units and Poison Control Centers) receiving similar reports to collect those data and maintain communication to encourage sharing of information. By monitoring reports of health effects possibly related to pesticide use, the

NYSDOH may identify:

- Serious, unusual, or repeated acute health effects that show a pattern of association with local or aerial spraying that might need further evaluation.
- Unexpected avenues of exposure that might require investigation and referral to the appropriate agency.
- Problems in responding to concerns and inquiries about pesticide health effects, including knowledge gaps or problems with educational materials.

The NYSDOH should use a standard form (see Appendix D) and data collection processes for reports of potential pesticide-related health effects from individuals and health care providers. The data collection form may be used by local health units. This form should be compatible with those already in use by NYS Poison Control Centers.

At the end of the spraying season, the NYSDOH should summarize information on all calls received including the volume of calls and the nature of the complaints.

NYSDOH should monitor all reports received by the Pesticide Poisoning Registry. By law, physicians, health facilities and clinical laboratories are required to report confirmed or suspected pesticide poisonings to the NYSDOH, via a toll-free telephone number. Reports received through the WNV surveillance activity should be reviewed to identify potential registry cases. These reports should be followed up as necessary.

The NYSDOH has prepared a physician fact sheet for the commonly used pesticides and has distributed it to hospital emergency rooms and physicians. In addition, this fact sheet is available on the NYSDOH web site.

# **Public Communication**

## **I. Introduction**

In September 1999, WNV, a mosquito-borne infection that can cause encephalitis, was found in NYS. During 2000, human illness in NYS was identified only in New York City, but WNV-infected mosquitoes were found in NYC and six NYS counties, while WNV-infected birds were identified in all but one NYS county. Therefore, enhanced public awareness, increased media cooperation and expanded prevention education, statewide, are important strategies to address the return of WNV in 2001. These strategies can promote public cooperation in reducing man-made collections of standing water in which mosquitoes breed; help at-risk individuals reduce their chances of being bitten by mosquitoes; and educate health care providers about the virus, its prevention, and the diagnosis and treatment of human encephalitis.

### **Highlights of Plan Changes for 2001**

- The NYS public communication program should move to a social marketing approach that emphasizes health promotion strategies to encourage individual behavior change.
- The enhanced program should have three inter-related components: health education; media relations; and environmental health risk communications.
- The “Fight the Bite” public communication campaign should be expanded statewide. The logo should be revised to reflect the health promotion emphasis of the campaign.
- All communications activities should emphasize that persons aged 50 and older are at greatest risk for serious illness from WNV.
- All communications activities should emphasize that children are not in a “high-risk” group for serious illness from WNV.
- Individuals, particularly persons aged 50 and older, should be advised of the array and the relative merits of personal protection techniques/measures.
- The public should be encouraged to report dead crows to local health units, but will be advised that not all dead birds will be or should be collected and tested for WNV.

## **II. Objective**

Working collaboratively with other state agencies, officials and representatives of local health units statewide, as well as community and environmental groups, the NYSDOH should maintain, expand and enhance the aggressive “Fight the Bite” public health education campaign that was initiated in 2000.

## **III. Implementation Plan**

### **A. Specific Objectives**

- Increase awareness among health professionals and the public of the potential risk for WNV infection.
- Encourage health care providers to promptly report cases of human encephalitis.

- Improve knowledge among health care providers of the signs and symptoms of human encephalitis, and of appropriate treatments, and of their duty to report possible cases of pesticide poisoning to the State’s pesticide poisoning registry.
- Enlist news and advertising media cooperation in presenting accurate representations of WNV in terms of at-risk populations and risk reduction, and promote informed, responsible reporting about WNV.
- Improve public knowledge of the sources and reservoirs of WNV (mosquitoes, birds and mammals).
- Improve public knowledge of high-risk populations (persons aged 50 and older) while addressing public concern relating to populations at lower risk (children, healthy adults).
- Encourage the elimination of mosquito breeding sites (man-made collections of standing water, such as backyard pools or bird baths, old tires, rain water barrels, leaf debris, etc.) on residential and commercial properties, as well as activities that will increase personal mosquito protection around the home, (e.g., clean clogged rain gutters, install or repair screens).
- Depending on the level of risk for WNV, as evidenced by bird, mammal and/or human surveillance, encourage the adoption of appropriate personal protection techniques by at-risk individuals (dress appropriately; consider using an insect repellent, but be informed about potential health effects; minimize outdoor activities).
- Increase knowledge of high-risk populations regarding the signs and symptoms of WNV infection.
- Provide members of the public with the information they need to make informed decisions regarding the use of insect repellents and to make choices about exposure to sprayed pesticides.

## **B. NYSDOH Activities**

### Health Education

NYSDOH should develop a health care provider education component that will include, but not be limited to: a professional education kit (containing a letter from the state health commissioner, fact sheets, treatment information, reporting instructions, samples of the public education materials and an order form); information on the DOH website; and news releases for professional journals and newsletters.

In addition, NYSDOH should enhance and expand upon the “Fight the Bite” public education campaign that was implemented in 2000. The campaign should include, but not be limited to: TV and radio spots; interior/exterior transit advertising; outdoor advertising; posters and flyers; news and feature releases; fact sheets and brochures; information on the NYSDOH website; information through the Center for Environmental Health 800 line; print advertising for ethnic and community weeklies and Pennysavers; and a PowerPoint® presentation and exhibit materials for use at public meetings. Materials should be pretested and prepared in English, Spanish and other appropriate languages, as well as in easy-reading versions, as necessary.

To promote statewide expansion and awareness of the “Fight the Bite” theme and logo, the NYSDOH should encourage and support the efforts of agencies undertaking WNV public education initiatives to incorporate the theme and logo into their health communication strategies. In addition, all “Fight the Bite” professional and public education materials should be designed to be easily localized and duplicated by local health units.

### Media Relations

The media relations component of the public communication program should encourage media participation in the statewide public education effort; use controlled media to disseminate key messages; promote accurate media representations of WNV; and promote informed, responsible reporting.

NYSDOH should develop and distribute radio and television public service announcements (PSAs) that will reinforce key public health messages. Paid advertising (electronic, print and outdoor) should be used throughout NYS. “B” roll footage of common mosquito breeding sites around a typical home or commercial properties will be provided to TV news outlets for use in illustrating WNV stories. An effort should be made to partner with broadcasters to air reminders about reducing areas of standing water in conjunction with weathercasts.

To ensure “continuity of message,” NYSDOH should provide local health units with media packets including, but not limited to: “Fill-in-the-Blanks” news releases and radio announcer PSAs; fact sheets; an Op/Ed article and list of Op/Ed department contacts at local newspapers; a “Journalists’ Guide to West Nile Virus” (fundamental facts about WNV, based on the latest scientific data, in a convenient format for busy reporters); and a sample letter to news outlets asking for assistance in ensuring consistency in the dissemination of spraying information when chemicals are used for larval or adult mosquito control. The packets should be distributed on a schedule timed to support seasonal messages.

NYSDOH should sponsor a WNV media day during Spring 2001 for science writers and health reporters. As in 2000, the NYSDOH website should be updated each weekday during the spring and summer to provide aggregate data of WNV testing results, and to post fact sheets, news releases, etc.

NYSDOH, along with public communications workgroup participants who represent local health units and environmental organizations, should monitor media reports and follow-up to correct significant, factual errors. Personal contact with journalists will be made, as necessary.

### Environmental Health Risk Communication

The environmental health risk communications component should provide information that consumers, particularly those at high risk, can use to make informed decisions regarding the use of insect repellents for themselves and/or family members. If, as mosquito season progresses, LHUs determine pesticide spraying to be necessary, whether for larval or adult mosquito control, essential information should be prepared and disseminated to help members of the public make

choices about reducing their exposure to the pesticides used. DOH should make available to counties brief and specific language that they may use to help people concerned about exposures from pesticide spraying.

NYSDOH should update or obtain any scientific literature that is essential to this activity. In addition, NYSDOH, with assistance from public communications workgroup representatives of local health units and environmental organizations, should revisit materials developed during 2000, particularly those that focus on pesticides (insect repellents for personal protection and aerial or ground spraying of pesticides for mosquito control). Modifications should be made to existing materials, as appropriate, and new materials will be developed, if necessary. To the extent possible, both new and revised environmental health risk communication materials should be field-tested to assure public understanding of the core messages.

The environmental health risk communication component may include: fact sheets and brochures; educational videos; exhibit materials or models; and postings on the NYSDOH website.

## **1. Target Audiences**

Target audiences should include all New York State residents and health care providers. Outreach efforts should be conducted by the NYSDOH, counties and other partners, as appropriate. Specific audience segments should include, but are not limited to:

- Property owners (homeowners, businesses, municipalities) — NYSDOH and County outreach through State Emergency Management Office (SEMO) and County Emergency Management offices; mass media; other communication vehicles
- Government officials and local opinion leaders — NYSDOH and County outreach through SEMO; County Emergency Management offices; mass media, other communication vehicles
- Doctors— NYSDOH outreach through Medical Society of State of New York (MSSNY); other professional societies, as appropriate; direct written contact with providers
- Nurses — NYSDOH outreach through State Education Department (SED) and the New York State Nurses' Association
- Physician assistants — NYSDOH outreach through professional societies
- Nurse practitioners — NYSDOH outreach through SED
- Media representatives (reporters, editors, public service directors, community service program producers, etc.) — NYSDOH and county outreach; press releases, PSAs, letters to the editor, editorial board meetings
- Operators of elder care facilities — NYSDOH outreach through its appropriate programs, NYS Office for the Aging (SOFA); county outreach through local offices for the aging and senior citizens centers
- Independent older adults (aged 50+) – NYSDOH outreach through SOFA, mass media, health care providers, other communications channels; county outreach as appropriate
- \*School superintendents/officials and School Nurse-Teachers/Health Educators/Athletic Directors— NYSDOH outreach through SED; county outreach as appropriate

- \*Youth organizations — NYSDOH outreach through NYS Office of Children and Family Services (OCFS); county outreach as appropriate
- \*Operators of day care and preschool facilities — NYSDOH outreach through OCFS; county outreach as appropriate
- \*Operators of children's camps — NYSDOH outreach through its Center for Environmental Health (CEH); county outreach as appropriate
- \*Parents – NYSDOH outreach through mass media, SED, OCFS; county outreach through school districts, PTAs, child health clinics  
(\*To address the misperception that children are in the high-risk group for WNV)
- Campground operators, Resort operators — NYSDOH outreach through State Department of Environmental Conservation (DEC), Office of Parks Recreation and Historic Preservation (OPRHP), Empire State Economic Development Corporation (ESEDC); county outreach as appropriate
- Beach, pool and parks and recreation managers — NYSDOH outreach through DEC, OPRHP; county outreach as appropriate
- Hikers, campers, hunting and fishing enthusiasts, birders — NYSDOH outreach through DEC
- Tourism offices, Chambers of Commerce — NYSDOH outreach through ESEDC
- Environmental groups — NYSDOH outreach through CEH; DEC
- Nature preserves, Botanical Gardens, Arboretums — NYSDOH outreach through DEC; county outreach as appropriate
- Farmers — NYSDOH outreach through NYS Agriculture & Markets (A&M), Farm Bureau, National Organic Farmers Association, Cornell Cooperative Extension
- Migrant workers — NYSDOH outreach through CEH
- Veterinarians — NYSDOH outreach through A&M, letter to providers
- Outdoor workers, unions — NYSDOH outreach through State Department of Labor (DOL), State Department of Transportation (DOT)
- Faith community — county outreach as appropriate
- Government agencies — NYSDOH and county outreach as appropriate
- Other audiences, as may be appropriate.

## 2. Timeline

The 2001 “Fight the Bite” campaign should commence in the early spring, and be designed to be maintained, and enhanced and expanded, reaching different segments of the target audiences, over the course of the mosquito breeding season (April-December). As in 2000, the NYSDOH should develop specific messages for delivery on an "as-needed" basis in response to evidence of increasing risk for infection/death.

### **Recommended Campaign Implementation, Maintenance & Expansion, Evaluation**

#### Level 1/Pre-Season (April-May) Messages:

- Your health department is prepared.
- Mosquitoes can carry disease.

- Find and eliminate mosquito-breeding sites. Clean up standing water around your home and your place of business.
- Mosquitoes can breed in unlikely locations – a bottle cap filled with water, leaf debris or clogged rain gutters. Discarded tires are a particular problem.
- Eliminating breeding sites will help lower your risk of being bitten, and may help reduce the need for spraying later on.
- Children are not in the high-risk group for serious illness from WNV.
- Persons aged 50 and older are at highest risk for serious illness from WNV.
- Dead crows could be a sign of WNV. Be sure to report them to your local health department. Note that not all dead birds will or should be picked up for testing.

#### Level 2/Early Season (June-July) Messages:

- Continue Level 1 messages.
- Your health department is working to protect you.
- Mosquitoes are starting to appear.
- The potential for human cases of WNV is increasing.
- Continue to find and eliminate mosquito-breeding sites.
- Continue to report dead crows to your LHU and follow their recommendations for disposal.

#### Level 3/High Season (August-September) Messages:

- Continue Level 1 and/or Level 2 messages.
- Mosquitoes are at their height.
- Continue to find and eliminate mosquito-breeding sites. Eliminating breeding sites will help lower your risk of being bitten, and may help reduce the need for spraying later on.
- The elderly have the highest risk of serious illness from WNV.
- Unless there is evidence of mosquito-borne disease, there is no need to avoid outdoor activities. If it is advisable to take precautions, health officials will provide that information.
- People at highest risk should protect themselves from mosquito bites. Consider use of a mosquito repellent containing DEET; wear appropriate clothing (long sleeves, long pants); or stay indoors when mosquitoes are biting.
- Recognize the signs and symptoms of encephalitis and seek medical care if needed. Mild, flu-like symptoms are not dangerous. Symptoms to be concerned about include headache with high fever, disorientation, and muscle pain and weakness.
- Continue to report dead crows to your LHU and follow their recommendations for disposal.
- Recognize that other animals could be affected. Contact your veterinarian if you have a particular concern about a domestic or farm animal.
- If spraying becomes necessary, here are the facts you need (e.g., spraying schedules, chemical facts, known health effects).

Late Season (October-December) Messages:

- Level 1 and/or Level 2 and, possibly, Level 3 messages.

Post Season (December-March) Message:

- Level 1 messages.
- Prepare for next season by keeping property clear of mosquito breeding sites.

**3. Recommended roles and activities of the NYSDOH, LHUs, and other partners/organizations.**

**a. NYSDOH Roles and Activities:**

The NYSDOH, with guidance from members of the WNV Communications Workgroup, should develop, produce, distribute and evaluate the above-referenced educational and risk communications materials and/or services; solicit statewide media support in the form of public service airtime/space; and, as necessary, purchase advertising airtime/space to communicate appropriate educational messages statewide. The NYSDOH should also assist and support LHUs with the application of the “Fight the Bite” theme/logo to their targeted outreach and education efforts; and with press announcements about new human, bird, animal and mosquito cases.

**b. LHU Roles and Activities:**

As appropriate, LHUs should disseminate “Fight the Bite” educational materials produced by the NYSDOH and, to the extent possible, provide outreach to target audiences within their counties. LHU representatives should participate on the Public Communication Workgroup and will provide advice and guidance to NYSDOH staff through discussion, materials review and information exchange. LHU representatives also should share materials they produce for use in their local WNV education campaigns that may be adaptable for use by other counties. As per the legal requirements, localities should publicize spraying locations and times via print and broadcast media at least 24 hours in advance.

**c. Other Partners’/Organizations’ Roles and Activities:**

Other workgroup members should assist the Public Communication activities by providing advice and guidance relative to communication strategies; by participating in materials review; and, as appropriate, by helping to engage other members of the environmental advocate community in promoting individual efforts to reduce or eliminate breeding sites for mosquitoes. To the extent possible, these partners also should assist in the dissemination of “Fight the Bite” educational materials.

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## Response to Public Comments

A draft of this plan was made available to the public on April 4, 2001, for comment. The Department received comments from local health departments and representatives from community, environmental, and other non-governmental organizations. Many of these comments were incorporated into the final version of this plan. The following section summarizes many of the comments and the Department's response.

### Prevention, Response and Control

**Comment:** The NYSDOH should clarify the meaning and implications of a public health threat declaration in a separate appendix of the plan.

**Response:** For vector-borne diseases (diseases transmitted by insects or other arthropods like mosquitoes and ticks), a public health threat has been defined within New York's Codes of Rules and Regulations (10 NYCRR Section 44.50). With regard to West Nile virus, a current public health threat declaration is based upon current evidence of the virus (in birds, mosquitoes, mammals, and/or humans) documented in a county. The NYSDOH Commissioner of Health makes the declaration of a public health threat upon receipt and evaluation of a letter from the affected county requesting the declaration. The declaration enables the county to undertake public health activities to control mosquito populations in accordance with the New York State WNV Response Plan. LHUs are eligible for increased state aid reimbursement for certain approved activities once a public health threat has been declared by the Commissioner (see appendix C). In the context of vector-borne diseases, a current public health threat and a public health emergency are synonymous.

**Comment:** A public health threat should not be declared in the absence of confirmed human cases of WNV infection.

**Response:** Appendix A of the plan emphasizes that adult mosquito control programs should be undertaken only after careful consideration of the WNV risk to human health. Factors other than a human case of WNV may also indicate a high probability of a human outbreak, including high mosquito infection rates, multiple positive mosquito species including bridge vectors, or equine or mammal cases. Implementation of a targeted mosquito control program may be warranted in the absence of a human case, if other indicators of intense epizootic activity are present.

**Comment:** The 1982 Environmental Impact Statement (EIS) is outdated; a new EIS should be prepared to assess the impacts associated with the use of pesticides in response to West Nile virus.

**Response:** New York City is completing a draft EIS for the adulticides used to control mosquitoes that may carry WNV. NYSDOH has been working closely with the City in that effort. The draft EIS is expected to be released later this spring, followed by a comment period. The final EIS is expected to be issued later this summer. The NYSDOH will carefully consider the City's final EIS in determining further actions that may be appropriate in connection with the implementation of the WNV Response Plan.

**Comment:** New York State should implement a WNV regional plan structure, process and payment system.

**Response:** The NYSDOH supports the concept of a regionalized approach to WNV surveillance, as outlined in the New York State Association of County Health Officers' (NYSACHO) plan. However, current reimbursement mechanisms do not allow the department to provide funding to LHUs on a regional basis. The NYSDOH recently used funding received from the Centers for Disease Control and Prevention to award grants to LHUs for WNV surveillance activities. These monies can be used by LHUs to support regional activities.

**Comment:** State Aid reimbursement should be restructured so that a positive virus isolation is not required for the higher rate of reimbursement. Higher reimbursement should be aligned with the plan's emphasis on activities conducted early in the season (e.g., education, larval population management, larval surveillance).

**Response:** The Plan cannot alter the existing statutory and regulatory structure of the State Aid program under Public Health Law Article 6. Reimbursement rates for mosquito and vector control and public health threats are specified in Public Health Law (Sections 611, 605) or regulations (10 NYCRR Part 44) and the Plan must be structured within these parameters. Enhanced reimbursement rates at 50% State share only go into effect when a current public health threat has been declared. While the preventive activities mentioned in the question are critically important, they do not, by themselves, trigger a current public health threat. To the extent possible the importance of early prevention and surveillance is recognized from a reimbursement perspective as reflected in Appendix C, Items A.1; B.1; B.2; and, B.4.

**Comment:** The NYSDEC in conjunction with NYSDOH should publish a report based on the 2-year findings of the impacts of chemical pesticides on birds.

**Response:** The NYSDOH will contact NYSDEC to discuss the feasibility and usefulness of summarizing this information.

**Comment:** We are extremely opposed to any use of chemical insecticides.

**Response:** Every effort has been made in this plan to emphasize the use of more aggressive integrated pest management procedures for a disease vector, education measures, and mosquito habitat source reduction where practicable, as well as promoting the use of biological insecticides such as *Bacillus sphaericus* that target only mosquito larvae in the aquatic habitat. However, management of a mosquito-borne human pathogen with no effective treatment for human cases requires the consideration of chemical insecticides as a last resort if all other measures fail, in order to suppress the potentially infective mosquito population. It is preferable to target these operations to the mosquito larvae while they are in a limited environment, prior to their emergence as adults where they become air-borne and widely dispersed.

### **Mosquito Surveillance**

**Comment:** Many counties are allocated only 5 mosquito pools per week for WNV testing at Wadsworth Center.

**Response:** Limitations need to be placed on mosquito pool submissions in order to balance the number of pools that can be tested and the provision of results in a timely fashion. The number

of pools that each county may submit per week may change during the mosquito season, as we know more about where WNV poses the largest threat, and as laboratory capacity issues evolve.

**Comment:** If an LHU wants to test more than its allotted number of mosquito pools per week, can these pools be sent to another laboratory?

**Response:** At present, we are not aware of any commercial laboratories that provide mosquito testing for WNV. The Centers for Disease Control and Prevention is capable of testing for WNV in mosquitoes, but its facilities will most likely be heavily involved with states which will be experiencing WNV for the first time in 2001. We will alert counties should other laboratories become available that could provide mosquito testing.

**Comment:** “Municipalities will submit a weekly summary of mosquito activity to the NYSDOH...This information may be made available for distribution to the public.” What information may be made available to the public and what is the rationale for this?

**Response:** Information on areas of high mosquito activity and high mosquito infection rates may be important in educating the public about areas to avoid, should that recommendation be necessary. During these circumstances, counties should take the lead in delivering this information to the public, but this information may also be made available on our website to supplement county information.

**Comment:** The plan focuses on *Culex pipiens* and *Culex restuans* mosquitoes, though several species were found to be positive in 2000.

**Response:** Current data on WNV indicate that these two species, though primarily bird-biting mosquitoes, are vital in maintaining and amplifying WNV in a given geographic area. Without this maintenance and amplification, it appears unlikely that WNV would be able to frequently “spill over” to human and other mammal populations. Control of these mosquito species in the late spring and early summer should help keep the amplification of WNV at a lower level, and thus prevent potential subsequent human cases of WNV. Research continues on a state and national level on the roles that other mosquito species may play in the WNV transmission cycle, and recommendations may change as more research is completed.

**Comment:** Why are only some mosquitoes appropriate for arbovirus testing?

**Response:** Not all mosquitoes transmit WNV, and not all mosquitoes will bite humans; thus, these mosquitoes are a lower priority for testing. In addition, some mosquitoes may not be appropriate for testing for reasons of quality or quantity; only identifiable mosquitoes should be tested, and only in sufficient quantities so as to maximize efficient use of resources.

Certain mosquitoes are also tested for arboviruses other than WNV. This is standard procedure that has been in place since before WNV arrived in New York State, and will continue to take place.

**Comment:** NYSDOH should involve the Regional District Offices to assist LHUs, particularly partial service counties, with WNV activities.

**Response:** Recognizing that many LHUs have limited staff and/or resources, the Department is hiring additional regional staff to assist LHUs with WNV activities, particularly larval and adult mosquito surveillance.

**Comment:** The \$5,000 cap on state aid reimbursement for mosquito surveillance in the absence of current virus activity is unrealistic and should be raised or eliminated.

**Response:** The NYS WNV Response Plan emphasizes a hierarchical control and response approach to minimize the risk of human and domestic animal disease due to WNV. Many of the critical activities that should be conducted early in the mosquito season are not subjected to the \$5,000 cap, including bird and mammal surveillance, education, and larval population management. Because the \$5000 cap on state aid reimbursement for mosquito surveillance in the absence of current virus activity is established by law (Public Health Law Section 611 (1)), only the State Legislature can raise or eliminate it.

### **Bird and Mammal Surveillance**

**Comment:** Information about federal and state plans to prevent further imports of WNV infection in birds, amphibians, etc., should be included.

**Response:** This issue has been discussed at the state and federal levels, and no testing, evaluation, screening, embargo, or other program has yet been devised to control the spread of the virus geographically by animal movement.

**Comment:** There is a need for determining source of infection for positive birds and mammals.

**Response:** There is currently no single definitive means of determining source of infection for positive birds and mammals. The plan emphasizes the use of multiple surveillance indicators in decision making.

**Comment:** Request details of how protocols in 2000 were modified after the initial detection of WNV.

**Response:** These details cannot be provided. There were wide ranges of responses across multiple LHUs and states, and a definitive analysis of this has not been made.

**Comment:** The plan has surveillance bias because it is prioritizing crows.

**Response:** The plan states that some areas only had positive birds of other species and that inclusion of other species may speed up viral confirmation in some areas. The purpose of WNV bird surveillance is for early confirmation of viral activity and to forecast human case risk. For the first goal, as many birds of multiple species can be tested as possible given the resource limits of the laboratories, and thus submission priorities have been prioritized. For the second goal, birds of other species did not serve as a useful forecasting tool in 2000 for human case risk.

**Comment:** Concern that testing priority is based on land area and not population density.

**Response:** The suggested numbers per county are not limits, they are merely suggestions for minimal surveillance numbers at the request of LHUs. We agree that an LHU may wish to target their surveillance activities around populated areas. Dead crow sightings automatically do that because crows are not seen in areas without people. LHUs are free to determine their own surveillance priorities and ways of calculating dead crow densities according to their needs.

**Comment:** Birds from geographic areas without WNV or birds found early in the season should receive lower priority than birds from areas with confirmed activity or birds found later in the season.

**Response:** We disagree. Once viral activity has been confirmed, there is less reason for testing, and, therefore, birds from such an area are a lower priority. Testing is most important for new areas early in the season in order to verify viral activity.

**Comment:** Clarify whether corvids or non-corvids have priority in reporting and testing.

**Response:** Crows are top priority because of their high susceptibility to WNV. LHUs may restrict their activities to crows, but some LHUs may not wish to do this for a number of reasons; therefore, we do not wish to restrict their surveillance activities for other species.

**Comment:** Preference to have 10 birds per week tested prior to a positive bird result.

**Response:** Counties may submit as many birds as they wish for possible necropsy and testing. Wadsworth Center is limited in its capacity, and overflow specimens may be sent by the WPU to the National Wildlife Health Center. No guarantees can be offered to any county about testing all their individual specimens.

**Comment:** Questions about the low number of bird submissions and use of private laboratories.

**Response:** To date, there are no private laboratories performing testing of birds for WNV. The submissions per week are merely guidelines developed at the request of the local health units for recommendations on minimum surveillance requirements. Testing more birds may speed up the time of viral confirmation. Once viral activity has been confirmed, this reason for a greater number of submissions is no longer valid. Birds beyond the capacity of the Wadsworth Center may be submitted to the National Wildlife Health Center.

**Comment:** Data is requested to assist in determining whether conditions have been met that require an increase in bird submissions (e.g., weekly number of dead crow sightings per square mile exceeds 0.1; surrounding areas have confirmed WNV activity; time period for confirmation of WNV activity in the county during previous years has passed).

**Response:** This information is or will be available on the HIN.

**Comment:** Concerns about limiting birds to one per county per week in early part of season delaying identification of virus.

**Response:** We agree that this may delay identification, and these guidelines should be used more as a 'floor' for submissions rather than a 'ceiling', realizing that increased numbers will have to go to other laboratories than Wadsworth Center. Language to clarify this is in the plan.

**Comment:** There is still confusion about how birds will be processed and decisions made about testing.

**Response:** It is not possible to establish rigid limits on the number of birds to be submitted or absolute commitments from processing laboratories. In addition, most areas would oppose rigid limits, and laboratories would find it difficult to be definitive because of factors that vary.

**Comment:** LHUs should publicize the importance of reporting the sightings of dead crows. Or, if a LHU wishes, it may instead publicize the importance of reporting the sightings of all ill or dead birds.

**Response:** Wording in this plan was changed to make these messages clearer.

**Comment:** Request details of bird shipping procedures.

**Response:** These details are provided in the annual guidelines to LHUs for bird and mammal reporting and submission (Appendix E).

**Comment:** Provide timeline for WPU and Wadsworth Center processing.

**Response:** It is not possible to specify timelines because of much variability depending on species, other specimens, etc.

**Comment:** Is the section on sentinel birds needed since they are not recommended as part of core surveillance activities?

**Response:** Sentinel flocks are a common component of arboviral surveillance (e.g. for EEE virus) and do need to be addressed and summarized in this plan.

### **Human Surveillance of West Nile Infections**

**Comment:** How will plaque reduction neutralization (PRNT) results be communicated rapidly to the local health units?

**Response:** We are currently working to get the PRNT results uploaded to the Health Information Network (HIN) in the same manner and in the same database as the other human laboratory data and results.

**Comment:** Additional details for conducting human retrospective surveillance and the system for data flow and information sharing should be included.

**Response:** The plan provides an outline for these activities. A packet of information detailing the human surveillance activities will be mailed to the local health units.

**Comment:** In addition to the LHU, the NYSDOH Commissioner should send a letter to all hospitals, or at least to sentinel hospitals, regarding active surveillance activities.

**Response:** The decision of which hospitals would participate in active surveillance and what activities would be conducted are best made by the LHU. If necessary, NYSDOH is available for guidance or technical assistance.

### **Human Surveillance of Possible Health Effects from Pesticide Exposure**

**Comment:** The appendix outlining the Surveillance of Possible Health Effects from Pesticide Exposure should be a separate chapter in the plan.

**Response:** This appendix is now in its own separate chapter.

**Comment:** Add NYSDOH's name to the "West Nile virus Pesticide Application: Human Exposure and Illness Report" form and include information on where it should be sent.

**Response:** This information has been added.

**Comment:** Counties should not be reimbursed for the use of adulticides without a NYSDOH approved plan to monitor for human pesticide exposure.

**Response:** Monitoring for reports of human exposures/symptoms is included in the WNV plan. The New York State Department of Health has a surveillance plan in place and is working closely with local health units to obtain reports of exposures/symptoms and is educating physicians that suspected or confirmed pesticide poisonings should be reported to the Pesticide Poisoning Registry. Local health units also have a role in making the general public aware that they should report suspected or confirmed pesticide poisonings to Poison Control Centers. A March 2001 mailing was done to all Emergency Room Directors of NYS hospitals with details of the Pesticide Poisoning Registry, a physician fact sheet, and a CD-ROM of the Environmental Protection Agency's handbook, *Recognition and Management of Pesticide Poisonings*.

### **Public Communication**

**Comment:** Several comments were received about the NYSDOH informational materials on insect repellents and the pesticides.

**Response:** The NYSDOH has been reviewing the insect repellents and pesticide fact sheets in conjunction with the communication work groups. Those fact sheets are being substantially revised after reviewing and considering all comments. The new fact sheets will be completed shortly.

**Comment:** The Fight the Bite logo should be changed to reflect the movement away from crisis communication (the red logo is a bit intense). A separate brochure should be developed for children's camp operators who may not wish to place such a "hot warning" on the counter.

**Response:** The plan calls for the logo to be revised to reflect the health promotion emphasis of the campaign.

**Comment:** School superintendents and officials in the list of target audiences should be notified about children being removed from the high-risk category.

**Response:** The plan addresses this concern, including among target audiences: \*School superintendents/officials and School Nurse-Teachers/Health Educators/Athletic Directors— NYSDOH outreach through SED; county outreach as appropriate (\*To address the misperception that children are in the high-risk group for WNV).

**Comment:** All New York State WNV public education literature should prominently display the NYSDOH 800 number and the recommendation to call in and log any instances of pesticide exposure.

**Response:** The 800 number will be included on all WNV literature produced by NYSDOH. Reporting of pesticide exposures is addressed in a separate section of this plan.

**Comment:** The public should be alerted to the use of larvicides as well as adulticides.

**Response:** The plan calls for public notification whenever spraying is conducted for either larval or adult mosquito control.

## **Appendix A**

### **New York State Suggested Guidelines for Phased Response to West Nile Virus Surveillance Data**

## Appendix A: New York State Suggested Guidelines for Phased Response to West Nile Virus Surveillance Data

Risk Category	Probability of Human Outbreak	Definition	Recommended Response
0	None	Off-season; adult vectors inactive; climate unsuitable.	Develop WNV response plan. Secure surveillance and control resources necessary to enable emergency response. Initiate community outreach and public education programs
1	Remote	Active mosquito season; areas anticipating WNV epizootic in 2001; no identified surveillance findings indicating WNV epizootic activity.	Response as in Category 0, plus: Conduct entomologic survey (inventory and map mosquito populations); source reduction; use larvicides at specific sources identified by entomologic survey and targeted at likely amplifying and bridge vector species; maintain vector and virus surveillance; community outreach and public education, emphasizing source reduction; avian mortality and human encephalitis/meningitis surveillance.
2	Possible	Active mosquito season; areas with confirmation of WNV activity in birds and/or mosquitoes.	Response as in Category 1, plus: increase larval control and source reduction and public education emphasizing personal protection measures, particularly among the elderly. Conduct active human surveillance and other surveillance activities to further quantify epizootic activity (e.g., mosquito trapping and testing).
3	Probable	Active mosquito season; quantitative measures indicating WNV epizootic activity at a level suggesting high risk of human infection (for example, high dead bird densities, high mosquito infection rates, multiple positive mosquito species including bridge vectors, horse or mammal cases indicating escalating epizootic transmission, or a human case with evidence of epizootic activity) and abundant adult vectors.	Response as in Category 2, plus: expand public information program to include TV, radio, and newspapers (use of repellents, personal protection, continued source reduction, risk communication about adult mosquito control); continue active surveillance for human cases; consider adult mosquito control program targeted at areas of potential human risk if the risk is likely to continue to increase and bridge vectors are abundant.*
4	Outbreak in Progress	Multiple confirmed cases in humans; conditions favoring continued transmission to humans (see Category 3)	Response as in Category 3, plus: implement or intensify emergency adult mosquito control program, enhanced risk communication about adult mosquito control, monitor efficacy of spraying on target mosquito populations.

\*In general, the finding of a WNV positive bird or mosquito pool does not by itself constitute evidence of an imminent threat to human health and warrant mosquito adulticiding. Adulticiding should be considered only after careful consideration of the WNV risk to human health by taking into account multiple factors, including documentation of the presence of West Nile Virus in the area, the numbers and species of the vector populations, the vectors' physiologic age, the density and proximity of human populations, the time of year, weather conditions, physiography of and accessibility to the area where the vector is located, rapidity of response required as determined by the seriousness of the public health threat, potential impact on people and the environment, and the likelihood that vectors in nearby areas not subject to control measures will migrate from the area if not subject to control. In general, ground application of pesticides should be the preferred method of control. Aerial spraying should be used only when necessary because of geographic considerations and should be limited to the immediate area where the vector population has been documented to exist through vector surveillance and to adjacent areas considered at risk for imminent disease transmission.

## **Appendix B**

### **Considerations for Adult Mosquito Control**

## **Appendix B**

### **West Nile Virus: Considerations for Adult Mosquito Control**

The main objective of mosquito control is to decrease the risk of a human outbreak of West Nile virus (WNV) infections. This should be primarily accomplished by:

- Continuing to stress reduction in mosquito habitats;
- Larviciding where feasible and practical;
- Using personal mosquito protection measures, especially for the elderly and immunocompromised.

Adulticiding is *supplementary* to these measures and is a local decision that should be based on the considerations listed (in no particular order) below.

#### **Triggers for Spraying**

Adulticiding should be considered only when there is evidence of WNV epizootic activity at a level suggesting high risk of human infection (for example, high dead bird densities, high mosquito infection rates, multiple positive mosquito species including bridge vectors, horse or mammal cases indicating escalating epizootic transmission, or a human case with evidence of epizootic activity) and abundant adult vectors. In general, the finding of a WNV positive bird or mosquito pool does not by itself constitute evidence of an imminent threat to human health and warrant mosquito adulticiding.

#### **When to Spray**

The goal of spraying is to reduce the risk of human disease by decreasing the number of vector adult mosquitoes as much as possible. The pesticide is effective only when it makes contact with a mosquito. This is most likely to happen when mosquitoes are actively flying. To this end, it is imperative that spraying take place when *Culex* mosquitoes—the primary target mosquitoes—are most active. This means spraying between dusk and dawn. It is also important to note when spraying will NOT be effective. Spraying during inclement weather--rain, fog, high winds--will simply knock the pesticide mist to the ground, rendering it inactive. In addition, spraying at temperatures below 55-60 degrees is less effective. At these temperatures, mosquitoes are slower and are usually resting on the ground in the shrubbery and leaf litter. The pesticide mist usually can't reach them there.

#### **Where to Spray**

Another consideration is the terrain in the proposed spraying area. If there is substantial vegetation bordering the roads, ground spraying with trucks may not provide adequate coverage. Dense vegetation associated with roadside trees, shrubs, or hedges can interfere with truck-mounted insecticide applications. In situations such as these, counties that choose to spray may wish to consider application of pesticides using backpack sprayers, or altering their route so that trucks can more efficiently apply the spray. Aerial application may be considered when all other methods of application are inadequate and/or inefficient. Aerial spraying should be limited to the immediate area where the vector population has been documented to exist through vector surveillance and to adjacent areas considered at risk for imminent disease transmission.

You can contact your local DEC office for guidance in situations involving spraying near water or with applications that might be hindered by vegetation.

## **Human Population Density**

The population density in an area where there is evidence of intense epizootic activity should also be taken into consideration. If the area is rural and there are few people, the cost and potential risks of spraying may not justify its use. If the area is heavily populated, you have stronger indications for considering adult mosquito control, since the goal of spraying is to minimize the risk of a human outbreak of West Nile virus infection.

## **Mosquito Population**

Information from mosquito surveillance can be helpful in determining when to conduct mosquito control, and in monitoring the effectiveness of control activities. While all mosquitoes do not need to be tested specifically for the presence of West Nile Virus, those that are tested can provide valuable information regarding spraying decisions. Be aware that surveillance efforts to detect virus in birds are much easier to conduct than similar efforts to detect virus in mosquitoes. What may be more important than testing mosquitoes for West Nile Virus is knowing the NUMBERS and SPECIES of the vector population in the locality. The best way to do this is by mosquito trapping. Systematic mosquito trapping, however, requires specially trained staff and is time intensive. For localities without this capacity, there are other potential sources of information on mosquito activity. Staff can visually inspect the area where a positive bird was found, or around human population centers for habitats likely conducive to mosquito breeding. Staff can also personally observe mosquito activity.

## **Lag Time**

It is important to look at the dates that the positive surveillance specimens (mosquitoes, birds, and/or mammals) were collected. In most cases the positive specimens will have been collected about two weeks before. In the time between the date the specimen was collected and the date when the test results are complete, circumstances may have occurred which would alter a decision to spray. For example, a county may have sprayed since the collection date, a weather event may have adversely affected mosquitoes, or mosquito habitat may have been modified resulting in a reduced need to spray.

## **West Nile Surveillance Results Over Time**

WNV surveillance information may be monitored by county or even smaller jurisdictions, such as towns, over time, to determine what is happening with the outbreak. For example, if there has been a consistently good system for recording dead crow sightings, and the number of dead crow sightings drops for several weeks in a row after spraying, that may indicate that the previous spraying has killed off a large enough number of mosquitoes that transmission to crows is not continuing. Such analyses should not be graphed by day (because of day-to-day instability in reporting), but analysis by week should be helpful.

## **Local Perspectives on Spraying**

Different communities have varying perspectives on the benefits of mosquito control. These should be taken into account in the decision whether or not to spray. This can be difficult, as people can have strong opinions on both sides of the issue. The US Environmental Protection Agency has approved these chemicals for use and they must go through rigorous testing in order to get that approval.

For further information about toxicity of the common pesticides used for adult mosquito control, please consult your local DEC regional office.

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Whether or not you choose to spray, it is recommended that you contact your regional DEC office and start to get some of the paperwork together regarding pesticide application permits, etc. You may also want to call some of your colleagues at other counties for advice—what did they do in the same situation, how did their bidding process for pesticide applicators go, etc.

The decision regarding spraying is basically a risk assessment: whether or not you, as a county, believe the risk of contracting West Nile Virus is greater than the risk from applying pesticides for mosquito control. It is also a cost assessment where you must take into account medical costs, life years lost (for WNV fatalities), costs of spraying campaigns, etc. As with any decision about access to health prevention and care, many factors must be considered. Hopefully, the above list of factors will assist in your local decision making process.

If you have any questions, and wish to discuss your situation further, please feel free to call the Arthropod-Borne Disease Program at 518-474-4568.

## **Appendix C**

### **Revised State Reimbursement for West Nile Virus under New York State Public Health Law**

**APPENDIX C: Revised State Reimbursement for West Nile Virus Under New York State Public Health Law**

<b>Criteria</b>	<b>Activities</b> <i>(see back for terms and definitions)</i>	<b>Reimbursement</b>	<b>Source</b>	<b>County Requirements</b>
A. No Public Health Threat	1. Human surveillance, education 2. Bird and mammal surveillance	36%, no cap	General Public Health Work (GPHW, Article 6)	Submit amendment to MPHSP & State Aid Application (SAA), gain DOH approval
	3. Mosquito surveillance	36% up to \$5,000	Vector Surveillance and Control (Article 6, Section 611)	Submit plan via form 0627-2377, gain DOH approval
B. Public Health Threat based on: Historical evidence of virus (once in three years or two or more times in ten years)	1. Human surveillance, education 2. Bird and mammal surveillance	36%, no cap	General Public Health Work (GPHW, Article 6)	Submit amendment to MPHSP & State Aid Application (SAA), gain DOH approval
	3. Mosquito surveillance	36%, up to \$5,000	Vector Surveillance and Control (Article 6, Section 611)	Submit plan via form 0627-2378, gain DOH approval
	4. Larval Population Management for prevention, including, but not limited to, habitat modification, and biological and/or chemical intervention on a countywide basis.	36%, no cap	General Public Health Work (GPHW, Article 6)	Submit amendment to MPHSP & State Aid Application (SAA), gain DOH approval
C. Public Health Threat based on: Current evidence of virus documented in county.	1. Human surveillance, education 2. Bird and mammal surveillance	36%, no cap	General Public Health Work (GPHW, Article 6)	Submit amendment to MPHSP & State Aid Application (SAA), gain DOH approval
	3. Mosquito surveillance	50%, no cap	Vector Surveillance and Control (Article 6, Section 611)	Submit plan via form 0627-2378 and include a written request to Commissioner for declaration of current public health threat; gain DOH approval
	4. Larval Population Management for prevention, including, but not limited to, habitat modification, and biological and/or chemical intervention on a countywide basis.			
	5. Adult mosquito control in approved areas			

*Note: Human surveillance and education activities are reimbursable only under state aid for General Public Health Work and requires an amendment to the MPHSP and GPHW State Aid Application. Costs associated with these activities will be excluded from Mosquito and Vector Surveillance and Control applications and vouchers.*

***APPENDIX C: Revised State Reimbursement for West Nile Virus Under New York State Public Health Law***

**Notes**

The activities involved in this reimbursement are those conducted in the calendar year (January 1 through December 31).

***Larval Population Management:*** Using single or multiple means to control, minimize, or eliminate the population of mosquito larvae in a given area. These means may include physical modification of mosquito larvae habitats, intervention with the larval life cycle using biological methods (such as bacteria), or use of chemicals to kill larvae or pupae. ***Note:*** Tire collection and/or disposal activities are ineligible for reimbursement or funding under Article 6 (General Public Health Work and Vector Surveillance and Control) or the WNV Surveillance and Education Grant.

***Larviciding:*** Use of chemical and/or biological means to kill mosquito larvae currently present, as well as to minimize the occurrence of future mosquito larvae or pupae.

***Adulticiding:*** Use of chemical agents to kill adult mosquitoes. Adulticiding can be done on the ground (on foot with backpack sprayers, by vehicle-mounted foggers, etc.) or in the air, dropping pesticides from helicopters or fixed-wing aircraft.

***Surveillance:*** Epidemiologic 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 data are used both to determine the need for public health action and to assess the effectiveness of programs.

***Note: Human surveillance and education activities are reimbursable only under state aid for General Public Health Work and requires an amendment to the MPHSP and GPHW State Aid Application. Costs associated with these activities will be excluded from Mosquito and Vector Surveillance and Control applications and vouchers.***

## **Appendix D**

### **Surveillance Report Forms**

## Appendix D

### Mosquito Breeding Habitat Description

County: \_\_\_\_\_ Town: \_\_\_\_\_

City/Village: \_\_\_\_\_ Site: \_\_\_\_\_

Location: \_\_\_\_\_

USGS Quadrant: \_\_\_\_\_ GIS Coordinates: \_\_\_\_\_

Inspection by: \_\_\_\_\_ Date: \_\_\_\_\_

#### Mosquito Breeding

Observed	Yes	No
Larvae Present		
Pupae Present		
Eggs Present		

Number of larvae/dip: \_\_\_\_\_

Species: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

<u>Site Description*</u>	
Environmental Setting:	Habitat Type:
Permanence of Habitat:	Habitat Condition:
Size:	Depth:
<u>Remediation-Control Options*</u>	
Biological Control:	Water Management:
Chemical Control:	Spray Hazards:

\*Accompanying sheet. Use more than one numerical code per category if necessary

Re-inspection by: \_\_\_\_\_ Date: \_\_\_\_\_

Number of larvae/dip: \_\_\_\_\_

Remediation-Control Conducted: Yes No Method: \_\_\_\_\_ Date: \_\_\_\_\_

### Mosquito Breeding Habitat Description

New York State Department of Health	
Code Sheet for Mosquito Breeding Site Survey	
<b>ENVIRONMENTAL SETTING</b> 1. Business or Industrial 2. Urban 3. Suburban 4. Farm 5. Natural or Undeveloped 6. Park or Recreational 7. County, City, or Town Property 8. State or Federal Property 9. Other (describe)	<b>HABITAT TYPE</b> 1. Salt Marsh 2. Fresh Water Marsh, Swamp, or Bog 3. Large Pond, Lake, or Ornamental Pond 4. Small Pond, Pit, or Hole (TH=tree hole) 5. Margin of Flowing Stream 6. Ditch or Sluggish Stream 7. Lg. Artificial Container (tank, boat, pool, etc) 8. Sm. Artificial Container (tire, drum, barrel, etc) 9. Other (describe)
<b>PERMANENCE OF HABITAT</b> 1. Permanent – wetland, marsh, swamp 2. Winter-Spring Pond 3. Semi-permanent (water present more than 8 days after heavy rain) 4. Transient or Temporary (water present less than 8 days after heavy rain) 5. Stagnant, Land locked pond 6. Mostly standing but with outlet, overflow, or movement 7. Flowing Stream 8. Tidal 9. Other (describe)	<b>HABITAT CONDITION</b> *Use + or – for amount* 1. Open water – no vegetation and bare shoreline 2. Water polluted (oil, sewage, gas bubbles, film) 3. Solid trash or debris in water (tires, cans, etc) 4. Water clean or nearly so 5. Woodland pool (no vegetation) 6. Vegetation present 7. Emergent Vegetation (CT=cattails, PH=phragmites) 8. Floating Vegetation 9. Much Marginal Vegetation 10. Other (describe)
<b>REMEDICATION – CONTROL OPTIONS</b> 1. Environmental Sanitation 2. Eliminate or Clean 3. Filling or Grading 4. Water Management 5. Impounding 6. Vegetation Removal 7. Fish, Amphibians or Predaceous Arthropods Present 8. Establish or Introduce possible biological control agents	<b>CHEMICAL CONTROL</b> 1. Application of larvicides possible 2. Accessible by truck 3. Accessible by air only 4. Application of adulticides 5. No application of pesticides 6. Water supply reservoir 7. Swimming area 8. Wetland 9. Threatened or endangered species present 10. Prohibited by owner or state/federal property 11. Other (describe)

### Weekly Miniature Light Trap Collection Form

Municipality: \_\_\_\_\_ Area: \_\_\_\_\_

Site: \_\_\_\_\_ Month: \_\_\_\_\_ Year: 20\_\_ \_\_

Genus species Name (Code)	Collection Dates				Total Females Per Week
	Day 1	Day 2	Day 3	Day 4	
Oc. abserratus-punctor (ABP)					
Oc. aurifer (AUR)					
Oc. canadensis (CAN)					
Oc. cantator (CTT)					
Ae. cinereus (CIN)					
Oc. communis gr. (CGR)					
Oc. dorsalis (DOR)					
Oc. japonicus (JAP)					
Oc. sollicitans (SOL)					
Oc. sticticus (STC)					
Oc. stimulans gr. (SEF)					
Oc. taeniorhynchus (TAE)					
Oc. triseriatus (TRI)					
Oc. trivittatus (TVT)					
Ae. vexans (VEX)					
Ae. _____					
Oc. _____					
An. punctipennis (PUN)					
An. quadrimaculatus (QUA)					
An. walkeri (WAK)					
An. _____					
Cq. perturbans (PER)					
Cx. pipiens (PIP)					
Cx. restuans (RES)					
Cx. pipiens-restuans (PRE)					
Cx. salinarius (SAL)					
Cx. territans (TER)					
Cx. _____					
Cs. melanura (MEL)					
Cs. morsitans (MOR)					
Cs. _____					
Ps. _____					
Ur. sapphirina (USA)					
<b>TOTAL</b>					

### CDC Gravid Trap and Egg Raft Collection Form

County: \_\_\_\_\_

Site: \_\_\_\_\_

Date: \_\_\_\_\_

Species	Number of			Parity			Number of	
	NB	BG	Male	N	P	%P	Egg Rafts	Larvae
PIP								
RES								
SAL								
PRE								

Date: \_\_\_\_\_

Species	Number of			Parity			Number of	
	NB	BG	Male	N	P	%P	Egg Rafts	Larvae
PIP								
RES								
SAL								
PRE								

Date: \_\_\_\_\_

Species	Number of			Parity			Number of	
	NB	BG	Male	N	P	%P	Egg Rafts	Larvae
PIP								
RES								
SAL								
PRE								



### Summary of Miniature Light Trap Collections

Municipality: \_\_\_\_\_ Area: \_\_\_\_\_

Collection dates: From: \_\_\_\_\_ To: \_\_\_\_\_

Genus species		Total	Number of	Average per
Name (Code)		Collected	Trap-nights	Trap-night
Ae. abserratus-punctor (ABP)				
Ae. aurifer (AUR)				
Ae. canadensis (CAN)				
Ae. cantator (CTT)				
Ae. cinereus (CIN)				
Ae. communis gr. (CGR)				
Ae. dorsalis (DOR)				
Ae. japonicus (JAP)				
Ae. sollicitans (SOL)				
Ae. sticticus (STC)				
Ae. stimulans gr. (SEF)				
Ae. taeniorhynchus (TAE)				
Ae. triseriatus (TRI)				
Ae. trivittatus (TVT)				
Ae. vexans (VEX)				
Ae. _____				
Ae. _____				
An. punctipennis (PUN)				
An. quadrimaculatus (QUA)				
An. walkeri (WAK)				
An. _____				
Cq. perturbans (PER)				
Cx. pipiens (PIP)				
Cx. restuans (RES)				
Cx. pipiens-restuans (PRE)				
Cx. salinarius (SAL)				
Cx. territans (TER)				
Cx. _____				
Cs. melanura (MEL)				
Cs. morsitans (MOR)				
Cs. _____				
Ps. _____				
Ur. sapphirina (USA)				
<b>TOTAL</b>				

# DEAD/ILL BIRD REPORT FORM, NEW YORK STATE, Year 2001

Local ID: (if a local ID is assigned): \_\_\_\_\_

Date completed: \_\_\_\_\_

## Dead / ill bird found by:

Date of initial report: \_\_\_\_\_

Name: \_\_\_\_\_

Day phone: \_\_\_\_\_ Night phone: \_\_\_\_\_

Address: \_\_\_\_\_ E-mail: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

## Bird information:

Date found: \_\_\_\_\_

Species:  American crow (common crow)  
 Fish crow  
 Blue jay  
 Other species (specify): \_\_\_\_\_

Symptoms:  Dead, evidence of trauma  
 Dead, no obvious cause  
 Ill, with neurologic signs  
 Other

Estimated death date: \_\_\_\_\_

Number of birds dead: \_\_\_\_

Number of birds ill: \_\_\_\_

Type:  Captive  
 Free-ranging

Maintained:  Indoor  
 Outdoor

## Location of bird:

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Township: \_\_\_\_\_

County: \_\_\_\_\_

Nearest cross street: \_\_\_\_\_

If public site, provide name: \_\_\_\_\_

Latitude83: \_\_\_\_\_ Longitude83: \_\_\_\_\_

Shipped for testing?:  Not shipped for testing  
 Shipped to WPU (DEC)  
 Shipped to Other (specify) : \_\_\_\_\_

WPU ID number : \_\_\_\_\_ (This number is pre-assigned by the WPU and is the number on the laminated card that must accompany the bird in shipment)

**PATIENT INFORMATION**

Last name \_\_\_\_\_ First Name \_\_\_\_\_ MI \_\_\_\_\_ County \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ Zip Code \_\_\_\_\_ State \_\_\_\_\_  
Telephone (\_\_\_\_)\_\_\_\_-\_\_\_\_ Date of Birth \_\_\_\_/\_\_\_\_/\_\_\_\_ Age \_\_\_\_\_ Occupation: \_\_\_\_\_  
Sex:  Male  Female Race:  White  Black  Am Indian/Alaskan  Asian  Other  
Ethnicity:  Hispanic  Non-hispanic  Unk Pregnant:  Yes  No  Unknown

**CLINICAL INFORMATION**

Hospitalized?  Yes  No If yes, Hospital Name \_\_\_\_\_  
Street Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Medical record # \_\_\_\_\_ Date of admission \_\_\_\_/\_\_\_\_/\_\_\_\_ Date of discharge/transfer \_\_\_\_/\_\_\_\_/\_\_\_\_  
**Date of first symptoms** \_\_\_\_/\_\_\_\_/\_\_\_\_ **Date of first neurologic symptoms** \_\_\_\_/\_\_\_\_/\_\_\_\_  
Current Diagnosis:  encephalitis  meningitis  other diagnosis \_\_\_\_\_  
Fever ( $\geq 38^{\circ}\text{C}$  or  $100^{\circ}\text{F}$ )  Yes  No  Unknown Altered mental status  Yes  No  Unknown  
Headache  Yes  No  Unknown Stiff neck/Meningeal signs  Yes  No  Unknown  
Seizures  Yes  No  Unknown Muscle weakness  Yes  No  Unknown  
Rash  Yes  No  Unknown Muscle pain  Yes  No  Unknown  
Other \_\_\_\_\_ **Outcome**  Recovered  Died  Unknown  
If patient died, date of death \_\_\_\_/\_\_\_\_/\_\_\_\_ Autopsy performed  Yes  No  Unknown

**LABORATORY INFORMATION / TEST RESULTS**

CSF (specify units) Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Abnormal?  Yes  No  Unknown  
Glu \_\_\_\_\_ Prot \_\_\_\_\_ RBC \_\_\_\_\_ WBC \_\_\_\_\_ Diff: Segs% \_\_\_\_\_ Lymphs% \_\_\_\_\_  
Gram stain \_\_\_\_\_ Bacterial Culture \_\_\_\_\_ Fungal / Parasitic tests \_\_\_\_\_  
Viral test results (Culture/ Serology / PCR) \_\_\_\_\_  
CBC (specify units) Date \_\_\_\_/\_\_\_\_/\_\_\_\_ WBC \_\_\_\_\_ Diff: Segs% \_\_\_\_\_ Lymphs% \_\_\_\_\_  
Bacterial Culture \_\_\_\_\_  
MRI Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_  
CT Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_  
EEG Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_  
EMG Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_

**Antiviral Treatment**  Yes  No  Unknown If yes, list below. **Date started:**  
1. \_\_\_\_\_

**Risk Factor Information:** (during 1 month before onset)

Patient traveled:  Outside country  Outside New York State  Outside county of residence  
 Animal or arthropod contact?  Yes  No  Unknown Specify: \_\_\_\_\_

**REPORTING INDIVIDUAL** (Please Print Clearly)

Title (ICN, Resident, Attending) \_\_\_\_\_  
Last name \_\_\_\_\_ First name \_\_\_\_\_ Telephone (\_\_\_\_)\_\_\_\_-\_\_\_\_  
Work address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

**SPECIMENS BEING SUBMITTED TO NYSDOH FOR TESTING**

Date Submitted \_\_\_\_/\_\_\_\_/\_\_\_\_  
CSF\*  Yes  No If yes, date collected \_\_\_\_/\_\_\_\_/\_\_\_\_ If no, was a lumbar puncture performed?  Yes  No  
\* If less than 1.0 ml of CSF is being submitted, please check preference:  Viral encephalitis PCR panel\* or  West Nile antibody  
Serum  Yes  No If yes, date collected \_\_\_\_/\_\_\_\_/\_\_\_\_  Initial or  Repeat Specimen  
Other  Yes Please specify \_\_\_\_\_ Date collected \_\_\_\_/\_\_\_\_/\_\_\_\_

**REQUESTING PROVIDER:** Last name \_\_\_\_\_ First name \_\_\_\_\_  
Work address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

**SEND SPECIMENS TO:** Encephalitis PCR Lab  
New York State Department of Health  
Griffin Laboratory  
Route 155  
Guilderland, NY 12084

**PLEASE NOTE: SHIP CSF  
FROZEN ON DRY ICE**

\*PCR panel includes: WNV, SLE, EEE,  
California serogrp, Cache Valley, Powassan  
Enterovirus, HSV, VZV, CMV and EBV

## West Nile Virus Pesticide Application: Human Exposure and Illness Report

Interviewer: \_\_\_\_\_ Site: \_\_\_\_\_ Today's Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time of Call: \_\_\_\_ : \_\_\_\_

### CALLER INFORMATION:

- Patient (self)     MD     Hospital  
 Parent/Relative     RN     Other  
 Friend/Neighbor     EMS    \_\_\_\_\_

LAST NAME: \_\_\_\_\_

FIRST NAME: \_\_\_\_\_

PHONE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

ZIP: \_\_\_\_\_

COUNTY: \_\_\_\_\_

### PATIENT INFORMATION:

GENDER:  M  F  Unknown

AGE: \_\_\_\_\_  Years  Months  Days  
 Unknown     Child     Adult

LAST NAME: \_\_\_\_\_

FIRST NAME: \_\_\_\_\_

PHONE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

ZIP: \_\_\_\_\_

COUNTY: \_\_\_\_\_

### EXPOSURE

SITE:  Home     Other residence     Workplace     School     Public Area     Unknown     Other \_\_\_\_\_

ROUTE:  Ingestion     Inhalation/nasal     Ocular     Dermal     Unknown     Other \_\_\_\_\_

TYPE:  Drift     Spray     Indoor Air     Surface     Contact     Unknown     Other \_\_\_\_\_

DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_    TIME: \_\_\_\_\_ : \_\_\_\_\_  am  pm  
           mo        day        yr

SUBSTANCE: \_\_\_\_\_  Unknown

ADDRESS/Description (*name of closest cross street*) of Exposure: \_\_\_\_\_

\_\_\_\_\_ COUNTY: \_\_\_\_\_

**SYMPTOMS** (*Do not read list, check off as described*)  NONE

General	Dermal	Gastrointestinal	Neurological	Respiratory	Ocular
<input type="checkbox"/> Drowsiness	<input type="checkbox"/> Burning sensation	<input type="checkbox"/> Abdominal pain	<input type="checkbox"/> Coma	<input type="checkbox"/> Bronchospasm	<input type="checkbox"/> Blurred vision
<input type="checkbox"/> Fever	<input type="checkbox"/> Hives/welts	<input type="checkbox"/> Bloody stools	<input type="checkbox"/> Confusion	<input type="checkbox"/> Cough/choke	<input type="checkbox"/> Corneal abrasion
<input type="checkbox"/> Other	<input type="checkbox"/> Irritation/pain	<input type="checkbox"/> Constipation	<input type="checkbox"/> Dizziness	<input type="checkbox"/> Hyperventilation	<input type="checkbox"/> Lid inflammation
	<input type="checkbox"/> Itching	<input type="checkbox"/> Dehydration	<input type="checkbox"/> Headache	<input type="checkbox"/> Nose/throat irritation	<input type="checkbox"/> Irritation/pain
	<input type="checkbox"/> Rash	<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Irritable	<input type="checkbox"/> Shortness of breath	<input type="checkbox"/> Tearing
	<input type="checkbox"/> Redness	<input type="checkbox"/> Nausea	<input type="checkbox"/> Seizure	<input type="checkbox"/> Wheezing	<input type="checkbox"/> Other
	<input type="checkbox"/> Swelling	<input type="checkbox"/> Vomiting	<input type="checkbox"/> Tingling	<input type="checkbox"/> Other	
	<input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Tremor		
			<input type="checkbox"/> Other		

Did the patient have any of these conditions at the time of exposure?

- Asthma    Multiple Chemical Sensitivity    Pregnant

**Medical Treatment of Case**

RECOMMENDATIONS:

- None                       ER                       Referral to MD                       Other \_\_\_\_\_  
 Observation               Treatment advice       Referral to PCC                       Unknown

Has patient sought any medical attention?  No    Yes:

Name of Health Care Provider: \_\_\_\_\_

Phone number: (     ) \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

## **Appendix E**

### **Guidelines for Reporting and Submission of Birds and Mammals, West Nile Virus, 2001**

## NEW YORK STATE DEPARTMENT OF HEALTH Updated May 1, 2001

### Guidelines for Reporting and Submission of Birds and Mammals, West Nile Virus, 2001

*These guidelines for the year 2001 should replace all bird/mammal reporting and sample submission guidelines developed in 2000.* To facilitate providing clarifications on any of these guidelines and sharing of information, LHUs are urged to post inquiries about bird/mammal surveillance and monitor responses on the NYSDOH Health Information Network (**HIN**) or Health Provider Network (HPN) **secure discussion forum** that have been established for each of the types of bird/mammal surveillance. Additional information about bird/mammal surveillance, including summary conclusions from 2000 surveillance nationwide, is available in the 2001 NYSDOH WNV Plan (on the NYSDOH public website at <http://www.health.state.ny.us>). In addition on the public website, a summary map and text is available for all WNV-positive specimens. Both the public website and the HIN have numerous other documents related to WNV in birds and mammals, and thus should be checked at least once daily.

**Reporting ill/dead birds:** All ill or dead birds should continue to be reported by the LHU on the DEAD BIRD REPORTING/SUBMISSION FORM on the HIN, regardless of whether the bird is submitted for WNV testing. Although labor intensive, tracking the numbers of dead birds, particularly crows, is a relatively less costly method for monitoring viral transmission than laboratory testing. In addition, county-level weekly dead crow densities (number of dead crow reports divided by the size of the county in square miles) was the WNV surveillance factor most closely correlated with the number of human cases in 2000. If assistance is needed in entering dead bird reports into the HIN, forms may be faxed to NYSDOH at 518-473-6590.

**Wildlife Services Dead Bird hotline:** On a pilot basis for 2001, the U.S.D.A. Wildlife Services (WS) office in Castleton, New York, will provide a toll-free dead bird reporting hotline for those LHUs that need assistance with dead bird reporting. The Wildlife Services Dead Bird hotline has been developed for 2001 in New York State with U.S.D.A. Animal and Plant Health Inspection Service funds.

As in 1999 and 2000, NYSDOH WNV public information and brochures will direct those seeing ill or dead crows to report them to their local health departments. Thus, each LHU may make its own choice about advertising their own or the Wildlife Services Dead Bird hotline number for dead bird reporting in their county. There are a number of potential options for LHUs in working with the Wildlife Services Dead Bird hotline:

- A LHU with sufficient resources to handle all their own dead bird reports may not wish to advertise the Wildlife Services Dead Bird hotline number or refer their callers to it. If an occasional call comes into the Wildlife Services Dead Bird hotline, the call can be entered by the Wildlife Services Dead Bird hotline operators and the LHU will be able to immediately see that information (see details below).

If a LHU wishes to have callers that occasionally reach the Wildlife Services Dead Bird hotline referred back to the LHU rather than having the report entered immediately on the HIN, specific instructions about that, including the LHU phone number, must be provided to the Wildlife Services Dead Bird hotline on the "USDA Wildlife Services

Dead Bird Hotline” folder on the HIN secure discussion forum. This procedure is not recommended due to the chance of losing the information due to the caller being unwilling to make a second call.

- LHUs with resources for handling their own dead bird calls but would like assistance in managing the reports may choose to advertise both their own local number and the Wildlife Services Dead Bird hotline number in their local WNV announcements and brochures. Thus the public will be free to contact either the LHU or the toll-free Wildlife Services Dead Bird hotline with their report. The LHU will be able to see immediately all the details on all calls entered to the HIN by the Wildlife Services Dead Bird hotline operators.
  - For example, LHUs may wish to manage their reporting workload by handling all reports of American crows or corvids (American crows, blue jays, and fish crows), and referring reports of other dead birds to the Wildlife Services Dead Bird hotline.
- LHUs with limited resources for handling dead bird calls may wish to advertise only the Wildlife Services Dead Bird hotline number in their local WNV announcements and brochures. In addition, if reports come into the LHU, the LHU may wish to program the announcement on their answering machine, or have the staff answering the calls, refer the callers to the toll-free Wildlife Services Dead Bird hotline and provide the number. The LHU will be able to see immediately all the details on all calls entered to the HIN by the Wildlife Services Dead Bird hotline operators.

The recommended procedure to maximize responsiveness to the public and obtain the best possible dead bird reporting information is to have both LHUs and the Wildlife Services Dead Bird hotline take calls. If calls are referred by one to the other (for example, if an LHU takes no calls and refers all callers to the Wildlife Services Dead Bird hotline, or if an LHU requests the Wildlife Services Dead Bird hotline to take no calls from that county and refer all callers to the LHU phone number) there is a chance that the person calling will not make a second call and the dead bird report will be lost from the reporting system. However, the LHUs may make their own decisions about their use of and interactions with the Wildlife Services Dead Bird hotline. Ideally, a system allowing the public the opportunity and choice to make reports to either the LHU or the Wildlife Services Dead Bird hotline maximizes opportunities for the public to report dead birds, and for LHUs to monitor dead crow densities and organize a county system for testing specific birds for viral confirmation.

The following are the procedures to be used by the Wildlife Services Dead Bird hotline:

- All reports of ill or dead birds, regardless of species, will be taken.
- Wildlife Services will use trained wildlife biologists to answer the Wildlife Services Dead Bird hotline phone calls.
- A Wildlife Services staff person will take calls and directly enter them into the HIN while conversing with the caller, during the operating hours for the Wildlife Services Dead Bird hotline, 8-4:30, Monday through Friday.
- An answering machine will be used for backup both during business hours and off-hours. The answering machine will provide a standardized message about the reporting system, encouraging the caller to call back, but also allowing information to be left on the machine.
- If feasible, the phone service will record the number of callers who get busy signals, in order to determine whether additional lines are needed.

- Wildlife Services staff will ask the callers whether they have already provided the dead bird report to any other agency such as the LHU, and if there is any uncertainty about that, will check the HIN to make sure the report has not already been entered.
- Wildlife Services staff will provide standardized professional guidance to the caller to help determine the species of bird sighted, with particular emphasis on whether the bird is a crow or not a crow, to improve the potential value of dead crow density calculations for forecasting human case risk.
- Wildlife Services staff will provide standardized guidance (developed by NYSDOH and the New York State Department of Environmental Conservation’s Wildlife Pathology Unit) to the callers for handling the birds safely.
- Wildlife Services staff will provide standardized guidance (developed by NYSDOH) about the purpose of dead bird surveillance, that it is used for local jurisdictions for overall tracking of WNV in an area, and that it cannot be used to provide information to individuals.
- Wildlife Services will not promise that individual birds will be picked up or tested, or that individual test results will be provided back to the person reporting. Wildlife Services will instruct the callers that those determinations will be made by the LHUs, based on local surveillance needs, laboratory capacity, and other surveillance indications for WNV activity. However, Wildlife Services will indicate on the HIN report form whether the bird is available for possible pickup and testing and the phone number of the caller if the caller wishes the LHU to contact them before pickup.
- Wildlife Services will use three new fields for the dead bird form to provide information to the LHUs about whether the bird is available for possible submission and testing:
  - Is the bird available for possible pickup and testing? (yes, no, unknown)
  - Does the caller wish to be contacted by the LHU before the bird is picked up? (yes, no, blank for not applicable)
  - Detailed location of the bird if available (such as: under pail on front porch, in ice chest in back yard, in school playground, next to highway median, etc.)
- For system evaluation purposes, on a separate (non-HIN) system, Wildlife Services will also record the number and types of other incoming WNV calls. NYSDOH will provide written guidance to Wildlife Services for handling them (for example, referring those reporting possible human cases to LHUs, referring those with questions about number of positives to NYSDOH website, etc.)

Wildlife Services/LHU coordination of dead bird reports:

- The dead bird report form on the HIN has a new query button on the top “AvailableBird”. The LHUs should click on this button at least once daily during business hours to generate a list of dead birds recently found and available for pickup (caller answered “yes” or “unknown” on that question). The list will contain the following fields: ID, species, date found, address, person reporting the bird, day and night phone numbers, whether the LHU needs to call the person reporting, and detailed location for the bird. The list will include all birds entered onto the HIN in the past four days, and will be sorted by report date (descending from current date) and species, to aid the LHU in reviewing the list when making decisions about possible birds for submission and testing.
- If the LHU has specific information they would like Wildlife Services to provide callers from their county, the most efficient way to communicate with Wildlife Services, NYSDEC’s Wildlife Pathology Unit, NYSDOH, and other LHUs simultaneously is to use the “**USDA**

**Wildlife Services Dead Bird Hotline” folder on the HIN secure discussion forum** to coordinate information with Wildlife Services. Such guidance may include, for example: “Tell callers that due to previous confirmation of WNV activity in the county, we will only be picking up and submitting for testing a limited number crows for the next month, and no other species”, etc. Using the secure discussion forum will allow NYSDOH and other LHUs to monitor the types of submission criteria being used in various counties, for inter-county coordination and sharing of guidance.

- Although use of the secure discussion forum is strongly encouraged to increase efficiency of receiving answers to inquiries, Wildlife Services may also be contacted by phone (518-477-4837) or email (Richard.B.Chipman@aphis.USDA.gov).

### **WNV testing:**

The following anticipated priorities and modifications should be utilized by LHUs in determining which birds to submit to the NYSDEC’s Wildlife Pathology Unit for possible necropsy and testing. Other than the first positive bird in a season and all positive mammals, test results (positive or negative) will not be phoned to LHUs. New laboratory results will be uploaded on weekdays to the HIN by 1 p.m, and LHUs should check the HIN daily for new test results. Indication of a new positive will have a delay so that only the LHU with the positive bird will see the result upon upload. The positive counts will be reflected in HIN summary tables the following day, and in public website summary maps and text the next time they are updated. The timing of public website summary map updates will vary by season. Early in the season, for example, in winter and spring prior to the first WNV-positive specimens, no updates to the public website maps will be necessary or made. When WNV activity becomes intense, the public website maps will be updated daily. As viral activity slows in the fall, updates will be reduced to weekly. Once the laboratory test results are completed and the results are posted to the HIN, if a LHU has a question about the specific laboratory tests done or the interpretation of the results, they should contact the laboratory listed on the HIN, usually either Wadsworth Arbovirus Laboratory (518-869-4525) or the National Wildlife Health Center (608-270-2445). The ultimate decisions about which birds to submit for necropsy and possible WNV testing is made by the LHUs. LHUs may develop their own arrangements, collaboratively with other local agencies, for picking up birds for possible submission or for having birds dropped off to a central location.

### **Considerations for dead bird submission and testing:**

- Birds from geographic areas without confirmation of viral activity in 2001.
- American crows (highest case-fatality rates and number of WNV-positive birds).
- Other corvids such as blue jays and fish crows (moderate number of WNV-positive birds).
- Other species of interest to the WPU, NYSDOH, or LHUs, due to concerns about potential alternative modes of transmission (ingestion), such as raptors (hawks, eagles, falcons); locally resident species (ruffed grouse) (positive results indicate *local* WNV activity, in comparison with birds that have greater movement patterns); hatch-year birds (if positive, will indicate WNV activity this year, not previous year); or threatened or endangered species.
- Birds from counties with large numbers of dead crow sightings (highest priority if county weekly dead crow sightings per square mile is greater than 1.5; moderate priority if county weekly dead crow sightings per square mile is between 0.1 and 1.5) if documentation of new or ongoing WNV transmission is needed.

- Birds in good condition (do not submit deteriorated birds—birds with maggots, crushed birds, or those falling apart).
- Because birds with encephalitis are likely to fly into buildings, or walk into roadways, birds with evidence of trauma may be submitted if they are still in reasonable condition.
- WNV does not usually cause group die-offs of birds, so dead birds found singly may be submitted.
- Birds from a mass group die-off (a large group of dead birds in a single place and time), particularly for non-corvid species (birds other than American crows, fish crows, and blue jays), should not be submitted without prior consultation with the NYSDEC’s Wildlife Pathology Unit.
- Because WNV does not always cause noticeable pathologic signs, birds without indications of typical WNV pathology on necropsy should also be considered for WNV testing.
- Although it is important to report dead crow sightings, not all dead birds will necessarily be tested for WNV. Selection for testing will depend on priorities and resources. Dead birds should not be submitted for WNV testing unless specific surveillance, research, educational, prevention, or control actions will be based on their results. Resources do not allow for WNV testing of dead free-ranging birds solely for the information of the individual submitter.
- When feasible, tissue banking with frozen and fixed tissue is recommended for further WNV histopathologic examinations and evaluation of the birds for other avian pathogens.
- If an LHU wishes to place a higher priority on a specific bird for necropsy and testing, that request (and reason for it) should be written on the NYSDEC’s Wildlife Pathology Unit submission card (e.g. “Please test at Wadsworth—new species”). This will assist the NYSDEC’s Wildlife Pathology Unit in triaging the birds appropriately.
- LHUs or others that submit birds outside of these priorities will have the birds necropsied by the NYSDEC’s Wildlife Pathology Unit and submitted for possible WNV testing as their resources permit.

Modifications of surveillance and numbers submitted for testing by season:

- It is recommended that the dead bird surveillance system be maintained year-round. However, for forecasting the risk of human WNV cases, the most critical time period is April through September.
- To avoid overloading laboratory resources and to provide general guidance for LHUs on sampling for laboratory testing, recommended numbers of dead birds to be submitted for WNV testing are provided below. Additional specimens beyond these limitations may be submitted year-round to the NYSDEC’s Wildlife Pathology Unit for possible necropsy, with the understanding that depending on resources and priorities, they may never be processed, or may be processed and submitted to other laboratories than the Wadsworth Center (with consequent longer turn-around times for results).
- If the specimens are of high priority but questionable condition (perhaps deteriorated), additional samples may be submitted in hopes of the laboratory receiving sufficient good quality specimens for testing.
- Approval from NYSDOH or the NYSDEC’s Wildlife Pathology Unit is not generally required for submission of birds to the NYSDEC’s Wildlife Pathology Unit for possible pathologic exam and subsequent WNV testing. If there is any question about the need for testing and testing priorities, the HIN/HPN secure discussion forum should be utilized to

facilitate rapid secure dialogue and sharing of changing information about individual situations and priorities. LHUs with frequent questions relevant only for that county and its data may request separate three-way secure discussions to be established for the individual county, NYSDOH, and WPU only to facilitate private communications and data correction.

- Positive birds have been found in February, and April through November. Thus, it is recommended for monitoring purposes that LHUs submit one dead bird per week year-round, but LHUs should particularly make an effort to submit birds for testing between April and November for early detection of viral activity and determination when viral activity has ceased in each mosquito season.
- *Prior to detection of WNV activity in a county*, it is recommended that LHUs increase submissions for testing to three or more birds per county per week, especially if: 1.) the weekly number of dead crow sightings per square mile exceeds 0.1; 2.) if surrounding areas have confirmed WNV activity; or 3.) the time period for confirmation of WNV activity in the county during previous years has passed.
- *After viral detection within a county*, it is recommended that the submissions for testing be reduced to two birds per county per week if testing is continued to monitor viral activity in various parts of a county or to assist in making control decisions. In addition, the types of birds and specimens considered for testing can be more targeted and restricted (e.g., American crows, birds with pathologic signs) and limited to certain areas of the county (e.g., areas without previous viral detection or areas in which the results will be used for further surveillance activities or education, prevention, or control programs.)
- Because mosquito activity and human cases are rarely documented beyond September, it is recommended that submissions for testing be reduced to one bird per county per week in October if additional testing is desired by the LHU for monitoring of viral activity.

### **NYSDEC's Wildlife Pathology Unit specimen shipping instructions:**

Using the procedures below will assist in rapid diagnosis for specimens and help with accurate record keeping. Problems or questions concerning specimen shipping for WNV should be posted on the HIN secure discussion forum. Specimens should be shipped to: Wildlife Pathology Unit, Wildlife Resources Center, 108 Game Farm Road, Delmar, NY 12054 (518-478-3032).

- **Bagging**
  - Each specimen should be placed in a clear plastic bag.
  - The bag should be properly sealed (either zipped shut if it is a ziplock or securely tied if it is non-ziplock).
  - The bagged specimen should then be placed in another clear plastic bag with the specimen submission tag.
  - Do not attach the tag to the specimen.
  - The specimen submission tag should NEVER be placed in the same bag as the specimen. This will cause contamination of the tag.
  - The tag should always be placed in the second clear plastic bag along with the bagged specimen.
  - The second bag should then be sealed in the same manner as the first.
- **Filling Out Specimen Tags**
  - All of the information that relates to each individual specimen should be filled out on the tag.

- A blank line represents missing information and will result in errors in tracking specimens.
- If there is no information available for a given line on the tag then "No information available", "unknown" or a similar statement should be written on that line.
- The following information must be recorded on each submission tag:
  - Species (If unknown write "unknown')
  - Date Found
  - Date of Death (if unknown write "unknown")
  - County
  - Township
  - Animal Found By
  - Zip codes and phone numbers are important
  - Animal Submitted By
  - Exact site: it cannot be assumed that the exact site where the specimen was found is the same as the 'Animal Found By' information. Therefore, this line must always be filled out, even if it matches the information on the back of the tag under 'Animal Found By'. This will assist in proper tracking of each specimen.
  - The remaining lines should either be filled in with the appropriate information or marked with an "unknown" or similar entry.
- **Shipping containers:**
  - It is recommended that leak-proof, *reusable* coolers/ice chests be purchased by local health units and used to ship birds to the NYSDEC's Wildlife Pathology Unit.
  - *Disposable*, leak-proof, sturdy containers may also be used.
  - The shipping containers should be clearly marked with the LHU's name, address, and phone number in indelible ink, and will be returned by the NYSDEC's Wildlife Pathology Unit.
  - **Rabies shipping containers should not be used for shipping any birds/specimens designated solely for WNV testing. Only mammals being tested first to rule out rabies, before WNV testing, should be sent in a rabies specimen container directly to the Rabies Laboratory, Wadsworth Center, DOH.**
- **Packaging/shipping**
  - Specimens should be shipped immediately to the NYSDEC's Wildlife Pathology Unit. Delays in shipping may cause autolysis of the specimens and render them unsuitable for necropsy.
  - All properly-bagged specimens with their submission tags should be placed in coolers with adequate ice packs.
  - Freezing of birds prior to shipping destroys blood cells and is not recommended. If birds are shipped immediately, there will be no need to freeze them.
  - Shipping birds with dry ice in the coolers will freeze the specimens and is also undesirable.
  - All coolers should have the LHU's name and address clearly written on them with permanent marker. This will ensure that the coolers are properly returned to the LHU. It is advisable to write "Return To:" before the return address if marking the coolers on the outside.
  - Address labels tend to become worn or tear with time and are not the best ways of identifying ownership of a cooler.

**Sentinel Chickens:** Few sentinel chickens tested positive in NY or any state in 2000 for WNV. Thus, for core surveillance activities, sentinel chicken (or other sentinel species) flocks are not recommended at this time. If an LHU wishes to do a WNV research study using sentinel species, please contact the Wadsworth Center's Arbovirus Laboratory, 518-869-4524.

**Mammals:** Testing of mammals can be problematic in regard to test interpretation and resources available for testing. Testing of mammals does not appear to be essential for WNV surveillance, because positive mammals do not provide the earliest indication of viral activity when dead bird surveillance is already established. However, testing of mammals may be indicated as a service to owners and veterinarians, or for research purposes.

- Only specimens being sent for testing should be entered in the HIN's Mammal Submission Forum. NYSDOH is not conducting surveillance of dead mammals as it is for dead birds. County residents who call the LHU to report ill or dead mammals should be thanked for their effort but no HIN record should be generated unless the mammal or a specimen (blood, CSF, etc.) is sent for WNV testing.
- Due to the risk of human fatalities from exposures to potentially rabid mammals, mammals with encephalitis should continue to receive priority for rabies evaluation first, before consideration of WNV. Before submission, rabies submission procedures may be reviewed at the NYSDOH Wadsworth Center's Rabies Laboratory website: <http://www.wadsworth.org/rabies/> or by phoning 518-869-4527.
- For wildlife, priority should be placed on mammals showing neurologic signs, particularly if it is a species not previously documented with WNV (see NYSDOH public website: <http://www.health.state.ny.us> and the WNV positive test results map for an update on species testing positive). Please do not send large numbers of mammals to the NYSDEC's Wildlife Pathology Unit without first consulting with them. To avoid overloading their phone lines, we recommend that LHUs use the mammal secure discussion forum on the HIN to consult with the NYSDEC's Wildlife Pathology Unit about sending mammal species. If an emergency consultation is needed, the NYSDEC's Wildlife Pathology Unit can be reached at 518-478-3032.
- For WNV testing of encephalitis cases in owned livestock or domestic animals such as horses, cattle, sheep, goats, swine, etc., Dr. Susan Trock of Cornell University/NYS Department of Agriculture and Markets should be consulted (518-457-3502) by the LHU or clinical veterinarian before submitting samples. Either the LHU or Ag & Mkts will need to enter the case into the HIN using the mammal form. NYSDOH's Wadsworth Center will routinely conduct WNV testing of horse brains that have been rabies-negative at the Rabies Laboratory. In addition, WNV testing may be available, depending on resources, at Cornell University's Veterinary Diagnostic Laboratory for ill or deceased livestock and domestic animals. Dr. Amy Glaser (email at [alg8@cornell.edu](mailto:alg8@cornell.edu)) or Dr. Ed Dubovi from Cornell University are available (607-253-3900) for questions about their WNV testing program. Samples collected for antibody detection should be collected in red top (clot) tubes and should be paired samples. Virus isolation has, to date, been successful with brain, spinal cord, and kidney.
- For WNV testing of encephalitis cases in small animals such as dogs and cats, the LHU or clinical veterinarian should consult with Dr. Amy Willsey, NYSDOH Assistant State Public Health Veterinarian (518-474-3186), before submitting samples to Cornell University's Veterinary Diagnostic Laboratory for WNV testing. Either the LHU or Dr. Willsey will

need to enter the case into the HIN using the mammal form. As with livestock, samples collected for antibody detection should be collected in red top (clot) tubes and should be paired samples. Samples to consider for virus isolation in deceased or euthanized animals should include brain, spinal cord, and kidney.

**Summary Contact List:** Please follow directions in guidelines for contacting staff with questions. Use of the HIN secure discussion forum\* is recommended when possible for faster response to inquiries by sharing of information and reductions in the number of individual, repeated inquiries. (\*has access)

Wildlife Services Dead Bird hotline

\*Richard Chipman, USDA Wildlife Services, 1930 Rt. 9, Castleton, NY,  
(p) 518-477-4837/(f) 518-477-4899 [Richard.B.Chipman@aphis.USDA.gov](mailto:Richard.B.Chipman@aphis.USDA.gov)

Wildlife pathology laboratory for bird/wild mammal necropsies

\*Ward Stone, NYSDEC Wildlife Pathology Unit, 108 Game Farm Road, Delmar, NY 12054  
(p) 518-478-3032/(f) 518-478-3035 [wstone@gw.dec.state.ny.us](mailto:wstone@gw.dec.state.ny.us)

NYSDOH bird HIN reporting system

\*Yoichiro Hagiwara, NYSDOH, Rm. 621 Corning Tower, ESP, Albany, NY 12237  
(p) 518-474-3186/(f) 518-473-6590 [yxh04@health.state.ny.us](mailto:yxh04@health.state.ny.us)

NYSDOH mammal HIN reporting system and WNV surveillance summary maps

\*Kate Schmit, NYSDOH, Rm. 621 Corning Tower, ESP, Albany, NY 12237  
(p) 518-474-3186/(f) 518-473-6590 [kjs05@health.state.ny.us](mailto:kjs05@health.state.ny.us)

consultant for pet neurologic illnesses and differential diagnoses for WNV

\*Dr. Amy Willsey, NYSDOH, Rm. 621 Corning Tower, ESP, Albany, NY 12237  
(p) 518-474-3186/(f) 518-473-6590 [alw08@health.state.ny.us](mailto:alw08@health.state.ny.us)

guidelines and analyses for NYSDOH bird/mammal surveillance system

\*Dr. Millie Eidson, NYSDOH, Rm. 621 Corning Tower, ESP, Albany, NY 12237  
(p) 518-474-3186/(f) 518-473-6590 [mxe04@health.state.ny.us](mailto:mxe04@health.state.ny.us)

testing of domestic animals/livestock

Dr. Amy Glaser, Diagnostic Laboratory, College of Veterinary Medicine, Cornell University, Ithaca, NY 14852  
(p) 607-253-3900/(f) 607-253-3943 [alg8@cornell.edu](mailto:alg8@cornell.edu)

Dept. of Agriculture & Markets domestic animal WNV surveillance

\*Dr. Sue Trock, NYS Dept. of Ag. & Mkts, Div. of Animal Industry, One Winners Circle, Albany, NY 12235  
(p) 518-457-3502/(f) 518-485-7773 [Susan.Trock@agmkt.state.ny.us](mailto:Susan.Trock@agmkt.state.ny.us)

NYSDOH laboratory testing

\*Dr. Laura Kramer, NYSDOH Wadsworth Arbovirus Laboratory, Griffin Labs, Slingerlands, NY  
(p) 518-869-4525/(f) 518-869-4530 [ldk2@health.state.ny.us](mailto:ldk2@health.state.ny.us)

federal laboratory testing of dead birds and wildlife

Dr. Kathryn Converse, National Wildlife Health Center, 6006 Schroeder Rd., Madison, WI 53711  
(p) 608-270-2445/(f) 608-270-2415 [kathy\\_converse@usgs.gov](mailto:kathy_converse@usgs.gov)

HIN programming for bird/mammal surveillance

\*Thomas M. Coleman, BHNSM, NYSDOH, C148 ESP, Albany, NY 12237  
(p) 518-473-1809/(f) 518-486-1632 [tmc05@health.state.ny.us](mailto:tmc05@health.state.ny.us)