

**Tuscarawas County Health  
Department**

**MOSQUITO CONTROL POLICY**



**Public Health**  
Prevent. Promote. Protect.

**Tuscarawas County Health Department**

## **Mosquito Control Cooperative**

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Preparation is the most important component of the Tuscarawas County Health Department's (TCHD) Mosquito Control Program. Achieving the most effective control of mosquito populations will necessitate the coordinated efforts of the Health Department and, just as importantly, its residents.

### What the Health Department will do:

- Engage in an aggressive public information campaign for its residents;
- Develop seasonal program for assessing the numbers and types of mosquitoes found in the Town;
- Emphasize source reduction by focusing on the elimination or modification of mosquito breeding sites;
- Apply EPA-approved larvicides to control and eliminate mosquito larvae; and
- Apply EPA-approved pesticides, meant for adult mosquito control, to quickly reduce the density of adult mosquito populations.

### What the residents must do:

- Reduce the amount of water used in their yards;
- Eliminate any stagnant bodies of water in their yards; and
- **Notify** the Health Department of swarms of mosquitoes, dead birds, or stagnant bodies of water in parks or rights-of-way.

## **Executive Summary**

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The objective of the Mosquito Control Policy (the “Policy”) is to attain an efficient and effective mosquito control operation that will provide the best results possible and be consistent with all ecological aspects and the best interests of Tuscarawas County. The Policy outlines strategies for the prevention and control of mosquito-borne diseases that pose a threat to public health. The Tuscarawas County Health Department’s immediate priority is to prepare for, and take preventive measures, to reduce the potential of the West Nile Virus (WNV) and other mosquito-borne diseases. The Policy emphasizes a coordinated Integrated Pest Management (IPM) approach to minimize the public health threat from mosquito-borne diseases, by utilizing proven sound mosquito control techniques recommended by the Centers of Disease Control and Prevention (CDC). IPM utilizes a variety of control techniques and evaluation procedures that includes:

- Public education;
- Personal responsibility;
- Source reduction;
- Surveillance and monitoring; and
- Chemical control (larvicide and adulticide).

The prevention of any mosquito-borne disease is most efficiently accomplished by the residents knowing how to recognize potential mosquito breeding sites on their property, and taking appropriate actions to eliminate these breeding sites. This Policy outlines actions that citizens can take to help reduce the threat of an arbovirus, and eliminate potential breeding sites from their property.

All citizens must be active in personal protection and do their part to aid in the abatement process to protect themselves, their family, their homes, and their community. Providing the public with the most updated information is only one part in the control of mosquito breeding and disease prevention. It is important for the residents to understand that the majority of mosquito breeding sites are developed due to the creation of artificial breeding sites caused by excessive-watering of lawns and plant beds, pet bowls, birdbaths, and flower pots with saucers, buckets, gutters, catch basins, or anything that may hold water outdoors around their homes.

Additionally, the Health Department Environmental Health staff will promote personal protection responsibility through a public information campaign, and will stress personal protection responsibility during the peak mosquito season. The Department will also utilize the CDC’s “Fight the Bite” campaign to supplement its public information efforts.

The Health Department will use source reduction and surveillance to track larval and adult mosquito populations, species types, and breeding locations to evaluate the potential for any arbovirus disease outbreak within the community. Knowing when and where a virus is likely to strike allows for precise targeting control techniques.

The use of larvicides and adulticides is a necessary component of mosquito control. Larviciding and adulticiding is recognized by the CDC and other federal health authorities as critical program elements in reducing public health threats from mosquito-borne diseases. Given the relative importance and capabilities of source reduction and larviciding to reduce the breeding of mosquitoes, such activities will be undertaken before adulticiding. It is acknowledged that source reduction and larviciding cannot completely eliminate adult mosquito populations in Tuscarawas County. Should surveillance data indicate increased mosquito population(s) and/or the presence of an arbovirus that poses a risk to public health, adulticiding can help reduce such populations over a large area in a relatively short period. Larviciding would only help reduce populations of future generations, but would not affect existing adult mosquitoes, which are infected or could be infected.

Larviciding is an important control mechanism since the objective of larviciding is to control the immature stages at the breeding sites before adult populations have had a chance to disperse, and to maintain populations levels at which the risk of arbovirus transmission is minimal.

It will be standard procedure for the Tuscarawas County Health Department to only use pesticides meant for adult mosquitoes as a last resort to control adult mosquito populations. The Health Department will only use adulticiding chemicals that have been tested, registered, and approved by the EPA. The Health Department's decision to use pesticides will be based the CDC's recommendation that mosquito adulticiding should only be used in situations where surveillance data indicates that it is necessary to reduce the density of adult mosquito populations quickly to lower the risk of WNV or other mosquito-borne diseases based on established set thresholds. These thresholds are:

- When a particular trap location has over 200 mosquitoes in one night of trapping;
- When a mosquito pool (one trap's catch of mosquitoes) has tested positive for WNV
- When the Tuscarawas County Health Department or the Ohio Department of Health reports a suspected human case of WNV or other mosquito borne illness in the County
- When the Tuscarawas County Health Department or the Ohio Department of Health reports a confirmed human case of WNV or other mosquito borne illness in the County
- When the Tuscarawas County Health Department is notified of a confirmed equine case of WNV in the County

## 1.0 INTRODUCTION

Mosquitoes are members of a family of nematocerid flies: the Culicidae, from the Latin *culex*, genitive, *culicis* meaning "midge" or "gnat". The word mosquito (formed by *mosca* and diminutive *ito*) is from the Spanish for "little fly". The female mosquitoes have modified mouthparts that form a long piercing-sucking proboscis, while male mosquitoes have mouthparts that are incapable of piercing skin. There are over 2,500 different species of mosquitoes that have been identified throughout the world, with approximately 150 species occurring in the United States (National Center for Infectious Disease).

WNV is maintained in nature in a manner similar to SLE, in a bird-mosquito cycle. Several *Culex* spp., including the common house mosquitoes, *Culex quinquefasciatus*, *Cx. pipiens*, and *Cx. salinarius*, and possibly also *Cx. restuans*, are the principal vectors to people. WNV appears to be

most dangerous to the elderly or immune-compromised patient. Since WNV has been demonstrated to amplify in the Asian tiger mosquito in the lab, it is possible that this mosquito is also involved in WNV transmission. In contrast to other mosquito-borne viruses, WNV also kills many birds in the U.S., especially crows, blue jays, and raptors. Surveillance efforts to detect the presence of WNV, therefore, can target the reporting and testing of those three types of dead birds. WNV does not cause as serious illness as some other arboviral diseases. In fact, only one out of every 150-200 people exposed to the virus will become ill, and less than 10% of clinically ill patients will die. Still, the public's perception and reaction to local reports of WNV cases cause much anxiety and fear in communities.

Female mosquitoes require still and stagnant water away from predators in which to lay her eggs. These areas can include, catch basins, gutters, birdbaths, tree holes, freshwater wetlands, and plant pots. Female mosquitoes will lay their eggs on the water surface either singly, or in a raft containing up to 300 eggs, and will hatch within about 24 hours. As adults, both the male and female adult mosquito feed on sugars from plants and from other insects that feed on plant sugars. This is the only source of nutrition for the males, as they do not feed on blood. The females use the sugar meals for energy and the blood meals for egg development (IFAS Mosquito Information, 2012).

## **2.0 PUBLIC INFORMATION / PERSONAL RESPONSIBILITY**

Public information relates to the development and maintenance of community-wide mosquito control activities and programs. Areas of individual responsibility relate to personal actions that residents can take to reduce personal risk from mosquitoes, such as eliminating breeding sites on their property, and using insect repellants (Banks, 2009).

### **2.1 PUBLIC INFORMATION**

The Health Department will identify potential partners to assure a continuous flow of consistent information. Additionally, the Department will also utilize the CDC's "Fight the Bite" campaign to supplement its public information efforts. Effective risk communication campaigns are successful because they provide accurate, clear, and timely information. The prevention of any mosquito-borne disease is most efficiently accomplished by ensuring that prompt and accurate information reaches the public. If the appropriate information reaches the public in a timely manner, personal protective measures may be implemented without panic and confusion.

If a sampled mosquito pool tests positive for arbovirus/diseases, information describing the location of the sampling event, the date, and other pertinent information will be provided. Techniques used to disseminate information may include, but not limited to, the following:

- Utilization of the Health Department's website to post information on mosquito abatement activities, personal protection best practices, and mosquito control website links;
- Letters, pamphlets, brochures, and/or door hangers to be distributed to residents
- Press releases describing WNV response activities; and
- The development of a public service announcement to be provided to local media outlets.

### **2.2 PERSONAL RESPONSIBILITY**

All citizens must be active in personal protection and do their part to aid in the abatement process to protect themselves, their family, their homes, and their community. Providing the public with the most updated information is only one part in the prevention of mosquito breeding and disease prevention. It is important for the residents to know that the majority of mosquito breeding sites are developed due to the creation of artificial breeding sites around their homes. The following information will assist the residents, and help them to become more aware of mosquito breeding sites, and prevent the spread of WNV and other mosquito borne-diseases.

#### 4-D's

- **Dusk / Dawn:** Dusk and dawn are the times of the day when mosquitoes are most active. During peak mosquito season, residents will be encouraged to stay indoors if possible or limit outdoor activity during these periods.
- **DEET:** Use repellants that contain DEET as the active ingredient for treating exposed skin areas.
- **Dress:** Dress to keep skin covered as much as possible, consider wearing loose, long sleeved shirts and long pants
- **Drain:** Drain any standing water on the property. This includes water from flower pots, bird baths, rain gutters, rain barrel, and pet dishes at least once a week.

#### Eliminate breeding sites for larvae

- Reduce all standing water around the property that provides breeding sites.
- Check the irrigation system to prevent excessive-watering of lawns and plant beds.
- Repair leaky pipes and outside faucets.
- Clean gutters every three (3) to four (4) months.
- Empty outside pet bowls when not in use.
- Clean and add fresh water to birdbaths once a week.
- Empty plastic wading pools weekly and store indoors when not in use.
- Use mosquito fish in decorative ponds and fountains.
- Fill holes or depressions in trees with sand or mortar, or drain them after each rain by drilling holes into the tree. .
- Use organic and/or EPA approved larvicide products following the direction on the product label.

#### Reduce adult mosquito populations

- Mow tall grass or reduce the amount of brush and other foliage on the property to reduce the resting sites for adult mosquitoes.
- For temporary relief in yards or high traffic areas, use organic and /or EPA approved fog treatments or surface treatments of insecticides that are labeled for that use, and apply them following the directions on the product label.
- Use screening in homes and pet kennels. Keep door and window screens in good repair, and be sure that they are properly sealed around the frames
- Protect pets with drugs that eliminate heartworm.

### **3.0 SOURCE REDUCTION**

The elimination or modification of mosquito breeding sites is critically, and typically, the most effective and economical solution for long-term mosquito control. The American Mosquito Control Association (AMCA) states that source reduction efforts can often minimize and/or eliminate the need for mosquito larviciding in the affected habitat. Additionally, source reduction can greatly reduce the need for adulticiding (AMCA A. M., 2009).

The normal habitat for mosquito larvae in the community is produced by summer rain pools and stagnate water from over watering of landscapes. Small pools of water that are created by irrigation or heavy rains during the summer produce most of our nuisance species of mosquitoes. A summer rainfall of less than an inch can produce breeding grounds for mosquitoes. Almost anything, whether natural or artificial, that will hold water for about a week or more, may breed mosquitoes. These insects have adapted to a wide variety of larval habitats, and it is important to check for larvae in any pools of standing water.

### **4.0 MOSQUITO SURVEILLANCE AND MONITORING**

The Health Department's surveillance and monitoring program will be used to pinpoint large mosquito populations in the community. The Department will survey and monitor adult mosquitoes using gravid traps. Captured mosquitoes will be sent to the Ohio Department of Health (ODH) for testing. Each sample will consist of mosquitoes that are collected at a single collection site. The information obtained from these surveillance efforts will be used to map mosquito populations, provide public information, and determine the occurrence of any mosquito-borne disease. The risk of mosquito-borne diseases depends on the size of mosquito populations and the incidence rate of disease. Mapping mosquito breeding habitat locations can help with source reduction, habitat disruption, larviciding and adulticiding activities, and strategically pinpoint target areas for community education efforts (NMVCA, 2003).

The Department will use mosquito surveillance and monitoring by collecting adult mosquitoes to determine what control measures are to be used, and evaluate the potential for any arbovirus disease outbreak within the community. The objective of the surveillance and monitoring program is to:

- Assess the threat of arbovirus exposure to citizens;
- Identify high risk adult mosquito population areas;
- Identify larval habitats that are in need of targeted control;
- Monitor the effectiveness of control measures; and
- Determine what level of control methods need to be implemented.

Typically, The Tuscarawas County Health Department's surveillance programs are conducted June through August. During these months, Tuscarawas County will only test for the WNV. If chemical control measures are needed to control mosquito populations, mosquito traps may be used more frequently to assess the effectiveness of the control measures.

## **5.0 TRAPS**

The purpose of using traps is to determine the relative human health threat due to WNV, and other mosquito-borne diseases, by detecting the presence of arboviral agents in female mosquitoes, primarily the *Culex* species. After the mosquitoes have been collected and counted, they will be sent to the ODH for identification and arbovirus isolation.

Traps will be placed in areas that provide overhead cover to protect the trap and captured mosquitoes from extreme environmental conditions. Targeted sites are to include but not limited to, park areas, easements, alleys, along waterways, reported areas of clusters of dead birds, and suspected areas that may support mosquito populations that may test positive for WNV.

The information obtained from these surveillance efforts will determine the need for various control measures, conduct more effective searches for larval breeding places, assess the extent of the problem, and potentially gauge the effectiveness of control measures.

## **6.0 MOSQUITO CONTROL MEASURES**

Mosquitoes may be controlled through an assortment of control practices. Such practices include physical control through source reduction; chemical control through the use of pesticides such as larvicide and adulticide; biochemical through growth regulation in the larval stage; and mechanical controls.

### **6.1 CHEMICAL CONTROL METHODS**

The CDC recommends that chemical control applications should be dependent on set threshold levels (CDC, 2003). This simply means that a certain defined risk needs to exist before particular chemical control measures are implemented. The most commonly used chemical control treatments are larvicide and adulticide. Larviciding and adulticiding is recognized by the CDC and other federal health authorities as critical program elements in reducing public health threats from mosquito-borne diseases. Given the relative importance and capabilities of source reduction and larviciding to reduce the breeding of mosquitoes, such activities will be undertaken before adulticiding. It is acknowledged that source reduction and larviciding cannot completely eliminate adult mosquito populations. Should surveillance data indicate increased mosquito population(s) and/or the presence of an arbovirus that poses a risk to public health, adulticiding can help reduce such populations over a large area in a relatively short period. Larviciding would only help reduce populations of future generations, but would not affect existing adult mosquitoes, which are infected or could be infected.

#### Larvicide

The Health Department will utilize EPA approved larvicides that will be applied according to the manufacturer's directions. Larviciding is an important control mechanism since the objective of larviciding is to control the immature stages at the breeding sties before adult populations have had a chance to disperse, and to maintain populations levels at which the risk of arbovirus transmission is minimal



The staff will utilize a larviciding program in combination with surveillance and source reduction to control mosquito larvae before they develop into biting adults. The staff will inspect locations that are known to have the potential to hold water and breed mosquitoes.

Larvicide efforts will include, but not be limited to, the following mosquito breeding sites on public property:

- Curb and gutter;
- Tree-holes and rock-pools;
- Vegetated edges of lakes and creeks;
- Culverts, catch basins, ornamental fountains, pools; and
- Manhole covers, storm water inlets, and discharge areas.

### Adulticide

It will be standard procedure for the Health Department to only use pesticides meant for adult mosquitoes as a last resort to control adult mosquito populations. The Department will only use adulticiding chemicals that have been tested, registered, and approved by the EPA. The Health Department's decision to use pesticides will be based the CDC's recommendation that mosquito adulticiding should only be used in situations where surveillance data indicates that it is necessary to reduce the density of adult mosquito populations quickly to lower the risk of WNV or other mosquito-borne diseases.

Adulticiding is the application of pesticides to kill adult mosquitoes. The ability to control adult mosquitoes is an important component of any IPM program. The Department will use chemical control measures in accordance with the CDC and the Ohio Department of Health's recommended thresholds based on the analysis of either larval or adult mosquito surveillance, or other available field data. These thresholds are:

- When a particular trap location has over 100 female mosquitoes in one night of trapping;
- When a mosquito pool (one trap's catch of mosquitoes) has tested positive for WNV
- When the Tuscarawas County Health Department or the Ohio Department of Health reports a suspected human case of WNV or other mosquito borne illness in the County
- When the Tuscarawas County Health Department or the Ohio Department of Health reports a confirmed human case of WNV or other mosquito borne illness in the County
- When the Tuscarawas County Health Department is notified of a confirmed equine case of WNV in the County

The Health Department will use the following guidelines when applying adulticides:

- Spraying shall be conducted between dusk and dawn;
- Notify the citizens when an area is being sprayed;
- When weather conditions are inappropriate for spraying a new notification must be issued;
- Publish spraying area(s) information on the Health Department's website and social media pages;
- In the case of an arbovirus event, the location of the positive site shall be sprayed a minimum of two times;
- Do not spray if the wind speed is below 1 MPH, or exceeds 10 MPH;
- Do not apply pesticides just before or during a rain event;

The CDC has reported that many mosquito control programs have relied heavily upon using chemical agents for mosquito control. Those mosquitoes that are exposed constantly to chemical applications are genetically able to resist higher pesticide concentrations. Eventually, the pesticide becomes less effective as resistance increases in the mosquito populations. The CDC states the onset of resistance can be minimized through:

- Using doses that are no lower than the lowest level rate to avoid genetic selection;
- Using less frequent applications;
- Using chemicals of short environmental persistence;
- Avoiding the use of slow release formulations;
- Avoiding using the same class of pesticides to control both adults and immature stages; and
- Applying pesticides to only hot spots. (Area-wide treatments should only be considered during imminent public health threats).

The effects on human health are primary factors considered in the regulation of adulticides. The CDC reports that pesticides that can be used for mosquito control, and have been approved by the EPA, do not pose an unreasonable risk to human health. The CDC recommends people who are concerned about exposure to chemicals, such as those with chemical sensitivity, or breathing conditions such as asthma, can reduce their potential for exposure by staying indoors during the application period (CDC, 2012).

In addition, the CDC posted a report that examined illnesses in nine states associated with exposure to pesticides used to control mosquito populations from 1999-2002. This study found that "application of certain insecticides poses a low risk for acute, temporary health effects among person in areas that were sprayed, and among workers handling and applying chemicals" (CDC, 2012). Currently, there is no concrete evidence to show that any pesticides for mosquito control are completely safe. Therefore, it is recommended that EPA approved adulticides should only be used when CDC and TCHD thresholds are met, and be used in accordance with the TCHD application recommendations as stated in this section.

## References

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# Tuscarawas County Health Department

## Mosquito Larvicide Application Log

DATE:

TOWNSHIP/VILLAGE/MUNICIPALITY:

SPECIFIC LOCATIONS:

Name of Applicator \_\_\_\_\_

Time Started \_\_\_\_\_

Time Stopped \_\_\_\_\_



# Tuscarawas County Health Department Adult Mosquito Spraying Log

DATE:

TOWNSHIP/VILLAGE/MUNICIPALITY:

SPECIFIC LOCATIONS:

Name of Applicator \_\_\_\_\_

Time Started \_\_\_\_\_ Time Stopped \_\_\_\_\_



## Tuscarawas County Health Department Mosquito Trap Count Log

TOWNSHIP/VILLAGE/MUNICIPALITY:

SPECIFIC LOCATION OF TRAP:

Date Counted	Number of Female Mosquitoes Identified	Spray indicated?	Initials of Counter