

The Pennsylvania West Nile Virus Control Program

Program Overview and Basic WNV Facts

In 2000, West Nile virus first appeared in Pennsylvania. The PA Departments of Environmental Protection, Health and Agriculture developed a West Nile Virus Control program that uses an Integrated Pest Management (IPM) plan. The goal of the program is to protect human health, using an environmentally friendly approach. IPM is a three-step process that integrates education and outreach with a science-based approach for managing mosquitoes.

Step 1: Surveillance From April through October, trained biologists canvas Pennsylvania in search of mosquito breeding sites. A breeding site can be anything from a bucket collecting water in your backyard to a sewage treatment plant. Biologists sample stagnant water for mosquito larvae and set traps to assess the adult mosquito population. Samples are identified and tested for WNV in the DEP and State Health Department lab.

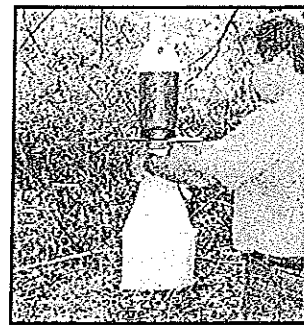
Step 2: Source Reduction Mosquitoes need stagnant water to breed. When inspecting a site, staff focuses on eliminating the breeding source. If every Pennsylvanian makes an effort to eliminate the source, this can go a long way to reducing mosquito populations and preventing WNV. Anything that can hold water for four days can become home to 1000s of mosquitoes!

Step 3: Control When source reduction is not a viable option, other control methods are used. After collecting samples, biologists determine the appropriate control measures. Breeding sites are treated with larvicides, such as *Bacillus thuringiensis israelensis* (Bti). Bti is a naturally occurring bacterium that selectively kills mosquito larvae. If adult populations are exceedingly high or test positive for WNV, adulticide treatments are used to reduce the human health risk. Adulticides are chemical pesticides that are applied using a backpack, ATV, truck or aircraft depending on the site, mosquito population and viral activity. The pesticides used today have been thoroughly tested and pose little to no risk to human and environmental health when used according to label instructions. All pesticides used by the program are applied by licensed pesticide applicators.

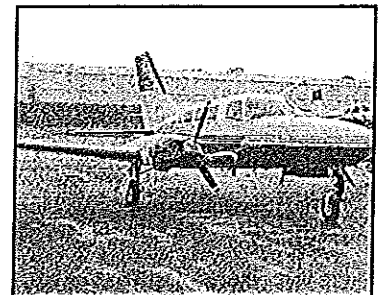
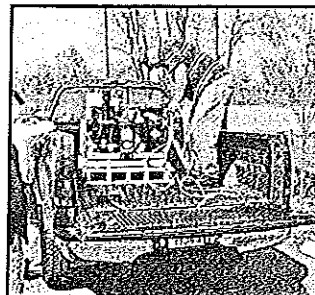
Surveillance Equipment Traps are used to estimate population size, species type, and viral activity.

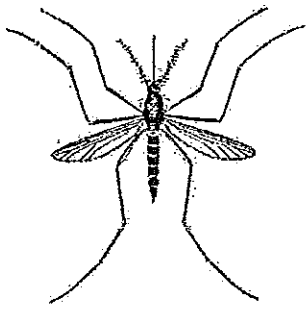
Gravid Traps collect adult mosquitoes looking to lay eggs. The traps are placed on the ground and collect overnight. Mosquitoes are attracted to organic "stink" water that is placed in the black tray beneath the trap.

Light Traps collect adult mosquitoes looking for a blood meal. Traps are hung from a tree limb and collect overnight. Mosquitoes are attracted to dry ice inside the trap that emits carbon dioxide.



Control Equipment Pesticides may be applied using backpacks, ATVs, trucks or aircraft.





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What happens if mosquitoes infected with WNV are found in my area?

From April to October, trained biologists canvas Pennsylvania sampling stagnant water for mosquito larvae and setting traps to assess the adult mosquito population. Adult mosquitoes are identified and tested for WNV in the DEP and State Health Department labs. If mosquitoes test positive for WNV, the following steps are taken.

Notification Immediately after receiving the positive results from the lab, the DEP regional biologists notify the county coordinator and the local health department. The results are also posted to the DEP website at www.westnile.state.pa.us.

Pre-Control Surveillance To determine if the infected mosquito population is localized or widespread, additional traps are set at the original collecting site as well as at a 0.5- to 1.0-mile radius from the original site. Biologists identify and eliminate stagnant water to reduce potential mosquitoes breeding sites.

Human Health Risk Assessment The risk to human health determines if control measures are necessary. There are many factors that need to be considered when assessing human health risks.

- **Infection Rate:** Infection Rate (IR) is the estimated number of infected individual mosquitoes per 1,000 mosquitoes tested. IR indicates what proportion of the mosquito population is carrying the virus. The higher the IR, the more likely a human will become infected when bit by a mosquito. For example, an IR of 1 poses much less threat than an IR of 5.
- **Mosquito Characteristics:** The species type and population size of infected mosquitoes can affect the risk of infection to humans. For example, a small population of infected *Culex restuans* is considered low risk; whereas, a large population of infected *Culex pipiens* is considered high risk.
- **Time of Year:** Mosquitoes are active during the warm months, typically April to October; however, the risk of contracting WNV is highest during August and September.
- **Location:** If infected mosquitoes are in a very urban area with a high human population, the human health risk of infection is much higher than in a rural area with a low human population.

Control The type of control depends on the level of risk to human health.

Human Health Risk = Low	Human Health Risk = High
<ul style="list-style-type: none"> ▪ Larval Control: All stagnant water actively breeding mosquitoes within and surrounding the infected site is treated for larvae. ▪ Adult Control: Limited and localized. 	<ul style="list-style-type: none"> ▪ Larval Control: All stagnant water actively breeding mosquitoes within and surrounding the infected site is treated for larvae. ▪ Adult Control: Barrier and ultra low volume spraying is conducted using a backpack, ATV, truck or aircraft. The equipment type depends on the terrain, treatment area size, and severity of infection.

Residents who would like to be notified of all spray events in Pennsylvania are strongly encouraged to register with DEP's News Releases distribution list by visiting www.westnile.state.pa.us/newreleases.

Post-Control Surveillance Following control treatments, traps are set to determine how successful the treatment was in reducing the mosquito population and eliminating the infected mosquitoes. If the risk to human health remains high, additional control efforts may be necessary.

A fast response is vital when trying to reduce the risk to human health; therefore, all the above steps usually occur within one week after discovering the infected mosquitoes.

For more information visit www.westnile.state.pa.us or call Delaware County Intercommunity Health at 610.891.5311.

West Nile Virus Facts

- West Nile virus can spread to animals and humans through a bite from an infected mosquito.
- 30 in 150 people infected will develop a mild infection called West Nile fever. Symptoms: fever, headache, body aches, skin rash, swollen lymph glands.
- 1 in 150 persons infected will develop a severe infection called West Nile encephalitis. Symptoms: high fever, headache, neck stiffness, disorientation, coma, tremors, convulsions, muscle weakness, paralysis.
- There is no known treatment or vaccine. Those infected with a mild infection often fully recover in a few days. Symptoms of a severe infection can last several weeks, although neurological effects may be permanent and the infection can be fatal.

Don't Grow Mosquitoes!

Look around your house. Do you have an old tire lying around? Clean the gutters lately? If it can hold water, mosquitoes can breed in it.

Eliminate the Source

- Remove old tires, buckets, watering cans
- Cover unused pools, trash cans, rain barrels
- Clean out gutters, birdbaths, kiddie pools

Treat the Problem

Bti is used to kill mosquito larvae and is widely available at many hardware stores. It is not harmful to people, pets, aquatic life or plants and efficiently eliminates mosquitoes. Bti dunks or granules are ideal treatment for birdbaths, rain barrels, persistent puddles, ornamental ponds, and planter drip trays. Follow the label for proper application rates.

Answers to Common Questions

How do people get the West Nile virus? From the bite of a mosquito infected with WNV.

Can West Nile virus be fatal? Yes, 3 to 15 percent of severe WNV infections result in death.

How common is West Nile virus? In the U.S., 27,605 people were diagnosed with WNV, and 1,087 died between 1999 and 2007. In Pennsylvania, 360 people were diagnosed, and 25 died between 2000 and 2007.

How do I find out if spraying will occur in my neighborhood and when? Your local health department and municipal office will know when and where spraying is scheduled to occur. The decision to spray is based on viral activity, surveillance data, and the risk to human health. During the summer, this information can change quickly and the decision to spray will be made only a few days before it will occur. *Residents who would like to be notified of all spray events in Pennsylvania are strongly encouraged to register with DEP's New Releases distribution list by visiting www.westnile.state.pa.us/newsreleases.*

To report a dead bird visit www.westnile.state.pa.us or call Delaware County Intercommunity Health at 610.891.5311.

Local County Offices

Bucks County Health Department	(215) 345-3334
Chester County Health Department	(610) 344-6455
Delaware County Intercommunity Health Coordination	(610) 891-5311
Montgomery County Health Department	(610) 278-5117
Philadelphia Department of Public Health	(215) 685-9005