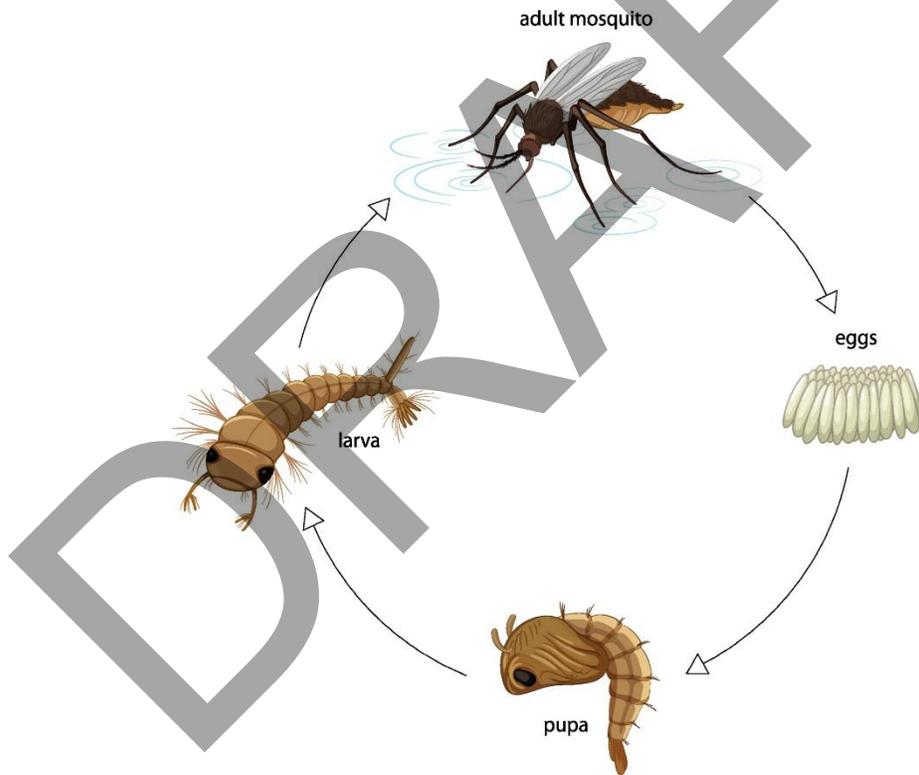


West Nile Virus Mosquito Surveillance and Response Plan



January 2026

West Nile Virus

Mosquito Surveillance and Response Plan

1. Introduction

West Nile Virus (WNV) is a mosquito transmitted disease occurring in the United States. WNV was first recorded in North America in 1999 in New York and spread in subsequent years. In 2012, the highest incident rates in the nation were seen in the Texas region, and have been relatively low in the following years.

Most people infected with WNV are asymptomatic. However, roughly 20% of infected people will develop a febrile illness, and about 1% will develop neuroinvasive disease such as encephalitis, meningitis, and acute flaccid myelitis. People who are older and who have immunocompromising conditions are at higher risk for more severe disease and death. Primarily spread by mosquitoes, WNV can also be transmitted by infected blood products.

WNV symptoms usually start 2-6 days after being bitten by an infected mosquito but can start anywhere from 2-14 days. It may take longer for symptoms to start for people with a weakened immune system. Most people (80%) infected with WNV do not develop symptoms. Following diagnosis and testing by a medical provider, the results are reported to the Texas Department of State Health Services (DSHS). DSHS communicates with Denton County Public Health (DCPH) which then investigates the reported case. Once a case is confirmed by DCPH, the City of Denton is alerted if the infected individual lives within the Denton city limits. The process of diagnosing and confirming a positive case may take 4 – 6 weeks.

The City currently works with the University of North Texas to perform mosquito surveillance. The surveillance process includes weekly trapping. Mosquitoes are sent to DSHS for WNV testing. DSHS typically reports results back in 4 – 7 days from receipt.

Mosquitoes generally need stagnant water that is isolated from fish or other small predators to grow from an egg into an adult. Larval habitats can range from marshes, freshwater wetlands, and tree holes to human-made structures like catchments, drains, gutters, and discarded tires. Reducing stagnant water where possible is part of the first line of defense for controlling mosquito populations and is the most effective method for mosquito source reduction.

Not all mosquitoes transmit WNV. Females feed on blood meal, and in north Texas the primary species is the *Culex quinquesfasciatus*. WNV is typically transmitted from an infected bird to a mosquito and then transmitted to other mammals, such as humans, through an infected mosquito bite. Mosquito life spans can vary; typically, female mosquitoes will live 1--6 weeks. Mosquito activity is highest with warm temperatures and decreases with colder temperatures (below 50 degrees and drops more significantly with freezing temperatures). Flight ranges are variable, but most typically fly up to a 1-mile radius.

The WNV Mosquito Surveillance and Response Plan (MSRP) was developed to meet several objectives:

- Provide guidelines on mosquito surveillance and testing approaches.

- Provide a systematic approach for using mosquito sampling and human disease data to establish risk levels.
- Establish actions to be taken for each risk level.
- Outline roles and responsibilities.

To target WNV, there are two main mosquito control pesticide groups used. The first includes larvicidal pesticides, such as bacillus thuringensis israelensis (BTi), that have targeted toxicity to mosquito larvae. Larvicide prevents larvae from becoming adult mosquitoes. The second pesticide group involves active spraying with pyrethrins and pyrethroids using ultra-low volume spraying to kill active adult mosquitoes.

2. Surveillance

The City will deploy mosquito traps weekly starting in May through the end of October of each year. In the event that weather conditions, such as a freeze, occur earlier than the end of October, the end of the season may align with the weather conditions.

The goals of the proposed mosquito surveillance include:

- Estimate of vector species abundance
- Identify high-risk areas of the City
- Assess the need for and timing of response actions
- Monitor the effectiveness of control measures and/or response actions

Trap locations may be determined using historical trapping data, possible prevalence of mosquitoes, and accessibility for deployment and collection.

3. Identification of Risk Level

The City has established three Risk Levels that focus on the existence and persistence of WNV infected mosquitoes.

Level 1 – Mosquito Awareness (WNV Infected Mosquitoes Possible)

This is the baseline condition when mosquitoes exist; however, WNV has yet to be detected within the City of Denton for the current season.

Actions:

- A. Disseminate information on prevention and control methods. Messages should emphasize the importance of mosquito breeding site reduction.
- B. Emphasize the use of personal protective measures.
- C. Begin surveillance in May/June of the year.
- D. Provide free larvicide to residents.
- E. Based on trapping data, evaluate the need for larviciding in targeted areas.

Level 2 – Mosquito Alert (WNV Infected Mosquitoes Confirmed)

Elevated condition when mosquito pools are reported WNV positive from trap locations.

Actions:

- A. Continue action items from Level 1.
- B. Increase personal protective measures messaging.

- C. Evaluate surveillance data and share it publicly.
- D. Apply larvicide at City properties on a regular schedule.

Level 3 – Mosquito Warning (Increased WNV Infected Mosquito Activity)

Heightened Response: WNV is confirmed in two consecutive trapping events at more than one location.

Actions:

- A. Elevate action items from Level 2 with targeted outreach and larviciding.
- B. Consider localized ground application of ultra-low volume mosquito adulticide. Review the following:
 - 1) Weather conditions (i.e., rainfall, temperature, wind speeds, etc.).
 - 2) Mosquito counts (i.e., decreasing or increasing trend).
 - 3) General ecology of hotspot area(s).
 - 4) Flight range of mosquitoes.
 - 5) Length of time since the WNV positive mosquito pools were collected.
 - 6) Season of the year (e.g., possible freezing temperatures).
 - 7) Human WNV case information, if available.

An Emergency Declaration may be proclaimed by the State, the County, or the City as needed to address WNV impacts. This could be triggered when multiple people are locally diagnosed with WNV or West Nile Neuroinvasive Disease, and conditions that favor the continued transmission of WNV to humans.

Actions:

- 1. Continue action items from above.
- 2. After consultation with DCPH, hold a meeting with the City Council to report on the situation, discuss options, and receive direction on possible spraying.
 - a. Level 3 – Action B. items will be considered.

4. Awareness and Communication

Public Awareness for the community will include but may not be limited to:

- Posters
- Brochures
- Website
- Denton TV Public Service Announcement (PSAs)
- Social Media

Messaging will be shared consistently across various media types to maximize reach. City facilities will use a combination of printed and electronic messaging to reach visitors. The community receives information in a wide variety of ways, and as such, the City will not limit itself to any one type of outreach.

As the City receives trapping data, the results will be posted on the website. Links to the County information, including their trapping sites, will be included. Some parts of the City of Denton may have a County trap closer to their residence or place of business.

If the City decides to proceed with a spray event (application of insecticide to attack adult mosquitoes), the following will be performed:

- Map with spray boundaries will be generated and shared
- Website update(s)
- Social Media update(s)
- Local signage (installed at key access points to the identified spray area)
- Beekeeper notification
- Automated robocall to the community
 - Utility account holders with date, time, and location, including spray area boundaries
- Area-specific notifications, such as private street owners

5. Mosquito Management

The City of Denton has adopted Integrated Pest Management (IPM) strategies, which include vector control. IPM utilizes a collaborative treatment approach with prioritization on mechanical and biological treatments.

Source Reduction (reduce breeding habitat)

Mechanical methods that eliminate breeding habitats (e.g., stagnant standing water).

Larvicide (control adult mosquito production)

Apply bacteria to breeding habitats to control the growth from egg to adult. Control the ability of mosquitoes from becoming adults.

Adulticide (attack adult mosquitoes)

Ground-based ultra-low volume spraying to target and hopefully kill adult mosquitoes.

Factors affecting the decision to use mosquito adulticide include weather and logistical conditions to make effective application. Typically, staff will consider the following while deciding when and where to spray:

- Current Conditions
 - Weather since trap collection that tested positive for WNV (e.g., heavy rain, freezing temperatures, etc.).
 - Weather forecast (e.g., freezing temperatures, etc.)

If natural events are likely to reduce the mosquito population, spraying may be unnecessary.

- Spray Conditions
 - Windspeed is forecast to be less than 10-12 mph.
 - Air temperatures are forecast to be above 50 degrees Fahrenheit.
 - Predicted rainfall.
 - Access to the hotspot area (e.g., road access).