



Monitoring and controlling mosquito larvae to prevent West Nile virus in Dane County

Updated June 2025

SUMMARY

The West Nile virus (WNV) surveillance and control program is an effort by Public Health Madison & Dane County to better understand and reduce the risk of West Nile virus in Dane County. This program has two components: monitor human cases of West Nile virus disease in our community; and monitor and control the larvae of mosquitoes capable of carrying West Nile virus.

MOSQUITOES CAN SPREAD SERIOUS DISEASE

- We test ditches, detention and retention ponds, and other public water sources for mosquito larvae to prevent mosquito-related illnesses, most notably West Nile virus.
- West Nile virus is carried by mosquitoes and is the [most common mosquito-borne illness in the U.S.](#) One out of 5 people who are infected show symptoms, and approximately 1 out of 150 people develop a serious and sometimes fatal illness.
- West Nile virus has been regularly found (endemic) in Dane County since 2003. Before 2020, we tested dead birds to monitor for West Nile because birds can also get the virus. You can report sightings of dead birds to the [Wisconsin Department of Natural Resources](#).

HOW WE TRACK MOSQUITOES

- In 2024, we sampled 691 locations for mosquito larvae in Madison, Middleton, Monona, Sun Prairie, and on the UW-Madison campus. We made 2,362 total inspections to those sites.
- Sites are on public property, such as in parks. Approximately 44% of sites are ditches and 41% are detention or retention ponds. Other sites include rain gardens, marshes, creeks, flooded areas, and golf course ponds.
- We sample for mosquito larvae along the water's edge by quickly dipping under the surface of the water with a dipper (plastic cup on a pole). Samples at each location are a mix of one to ten dips.
- We then take the sample back to the lab and identify the species of the collected larvae. Since WNV is considered endemic in Dane County the larvae are not tested for the virus. We look for two species of mosquito larvae that spread the most disease—*Culex* (most common carrier of West Nile virus) and *Aedes* (can carry West Nile virus, but less common. They are also vectors for some other mosquito-borne illness, such as La Crosse encephalitis). *Culex* mosquito activity is defined as the presence of the species *Culex Pipiens* and/or *Culex Restuans*; these mosquito types are capable of transmitting WNV in Dane County.
- When three or more *Culex* larvae are found per dip, the site is treated with larvicide, a chemical that specifically kills/targets only mosquito larvae.

WHAT WE FOUND

- 4.8% of all inspected sites had high levels of *Culex* mosquito larvae present.
- 3.6% of all inspected sites had high levels of *Aedes* mosquito larvae present.

- Six cases of West Nile virus in humans were reported in 2024. Between 2002 and 2024, there have been 56 total cases and 2 deaths related to West Nile virus disease in Dane County. These cases are an undercount and represent the most severe cases of West Nile virus disease, as people with mild West Nile virus are unlikely to be tested. Data from 2024 are preliminary.

INTRODUCTION



Public Health Madison & Dane County partners with the City of Middleton, City of Monona, City of Sun Prairie, Town of Madison, and University of Wisconsin to monitor and control the breeding activity of mosquitoes capable of carrying West Nile virus on public property. The main concern is the *Culex* mosquito, which is the primary carrier of West Nile virus in humans. In addition, other mosquito species that can also carry West Nile virus, such as *Aedes* mosquitoes, are monitored.

From late May through August, public health staff sampled sites to identify areas hosting large numbers of mosquito larvae. In 2024, the end of the mosquito season extended into October due to a late first frost. Sites where high levels of *Culex* larvae were found, larvicide was applied to eliminate them.

When a person tests positive for West Nile virus, the test is reported to the health department. Public health staff follow up to ensure the person has access to medical care and gather information about where they may have been exposed. Tracking these illnesses helps identify trends and better understand the virus's presence in our community.

This report summarizes mosquito monitoring and treatment efforts in the metropolitan area, along with trends in people in Dane County who tested positive for West Nile virus. The results are also displayed in this [dashboard](#).

MONITORING FOR WEST NILE VIRUS

MONITORING BIRDS FOR WEST NILE VIRUS

Prior to 2020, Public Health Madison & Dane County participated in statewide efforts to collect and test dead crows and blue jays for West Nile virus. These types of birds are most likely to get WNV. Once WNV was consistently found—that is, endemic—in Dane County and throughout the state, bird monitoring was discontinued.

MONITORING PEOPLE FOR WEST NILE VIRUS

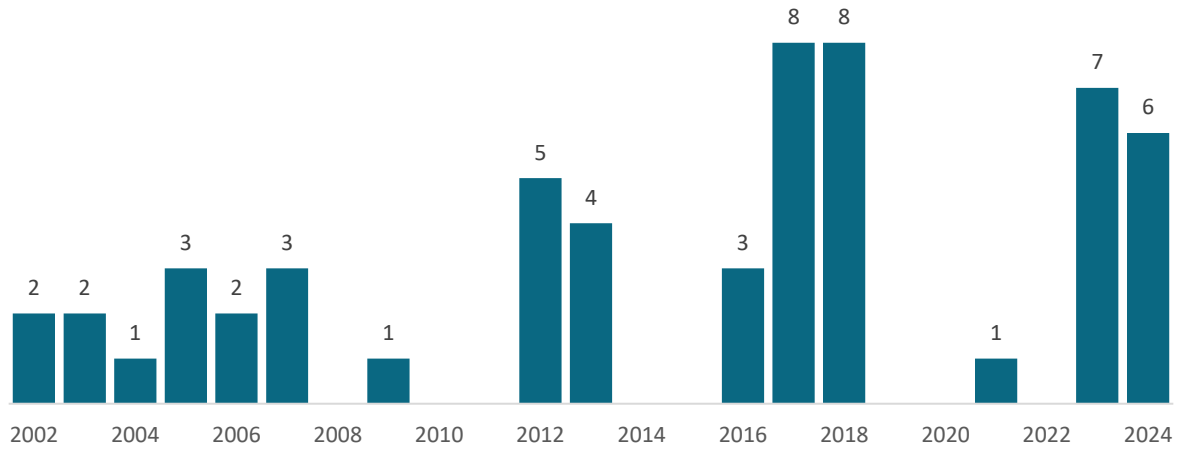
Most people (8 out of 10) infected with WNV disease will have no [symptoms](#), but approximately 20% will experience a fever plus other symptoms like headache, body ache, joint pain, vomiting, diarrhea, or rash. About 1 in 150 people with WNV disease will develop serious illness affecting the central nervous system such as brain or spinal swelling (encephalitis) with people over 60 years of age at the greatest risk.

Six people were reported with WNV infection in Dane County in 2024, with no deaths. Interview data suggests that the majority of these cases were acquired locally. Compared to national and statewide data, Dane County saw a higher rate of WNV infection than Wisconsin or the United States in 2024; however, this rate fluctuates widely from year to year.

Table 1. West Nile virus rates in Dane County, Wisconsin, and U.S. – 2024

	West Nile virus infections per 100,000 population	Deaths due to West Nile virus per 100,000 population
Dane County	1.0	0
Wisconsin	0.54	0.05
U.S.	0.53	0.05

Figure 1. People with West Nile virus in Dane County



Since there is no vaccine currently available to prevent WNV disease, public health focuses on monitoring and controlling the mosquito populations that can carry the virus to reduce the risk to the community.

MONITORING MOSQUITO POPULATIONS

During the summer of 2024, public health staff completed 2,362 inspections of 691 sites to evaluate *Culex* and *Aedes* populations in the metro area.

At each surface water source, public health staff sampled for mosquito larvae along the water's edge by quickly dipping under the surface of the water with a dipper (plastic cup on a pole). Samples at each location consisted of a composite of one to ten dips. The number of dips depended on the size of the water source and the number of larvae present. Larvae activity for each sample was measured as the number of larvae per dip. When three or more *Culex* larvae are found per dip, the site is treated with larvicide. Most mosquito monitoring is performed at surface water sources. The table below lists the number of sites by community with high concentrations of *Culex* or *Aedes* larvae; all other sites tested reported either low concentrations of larvae or no larvae noted.

Findings

As [shown on our dashboard](#), a total of 33 sites (4.8%) of inspected sites produced high numbers of *Culex* larvae and 25 (3.6%) sites produced high numbers of *Aedes* larvae, at least once during 2024 (Table 2). Seven inspection sites reported high levels of both *Culex* and *Aedes* larvae in separate inspections of the site.

Table 2: Areas with high levels of *Culex* and *Aedes* mosquitoes, 2024

	High <i>Culex</i> (% of inspected sites)	High <i>Aedes</i> (% of inspected sites)	Total number of sites inspected
City of Madison	25 (5.9%)	18 (4.2%)	424
City of Sun Prairie	1(0.9%)	3 (2.6%)	116
City of Middleton	5 (6.4%)	2 (2.6 %)	78
UW Madison (includes campus and arboretum)	1 (3.6%)	1 (3.6%)	28
City of Monona	1 (5.0%)	0 (0%)	20
Town of Madison	0 (0.0%)	0(0.0%)	15
Town of Burke	0 (*)	0 (*)	3
Village of Maple Bluff	0 (*)	0 (*)	3
City of Fitchburg	0 (*)	0 (*)	3
Village of Shorewood Hills	0 (*)	1 (*)	1
Total	33 (4.8%)	25 (3.6%)	691 [#]

**Percentages not calculated for sites with fewer than five samples*

*# Eight inspection sites reported high levels of both *Culex* and *Aedes* larvae in separate inspections. The site is counted only once in the Total Metro Area site total of 691 but each counted in both *Culex* and *Aedes* totals.*

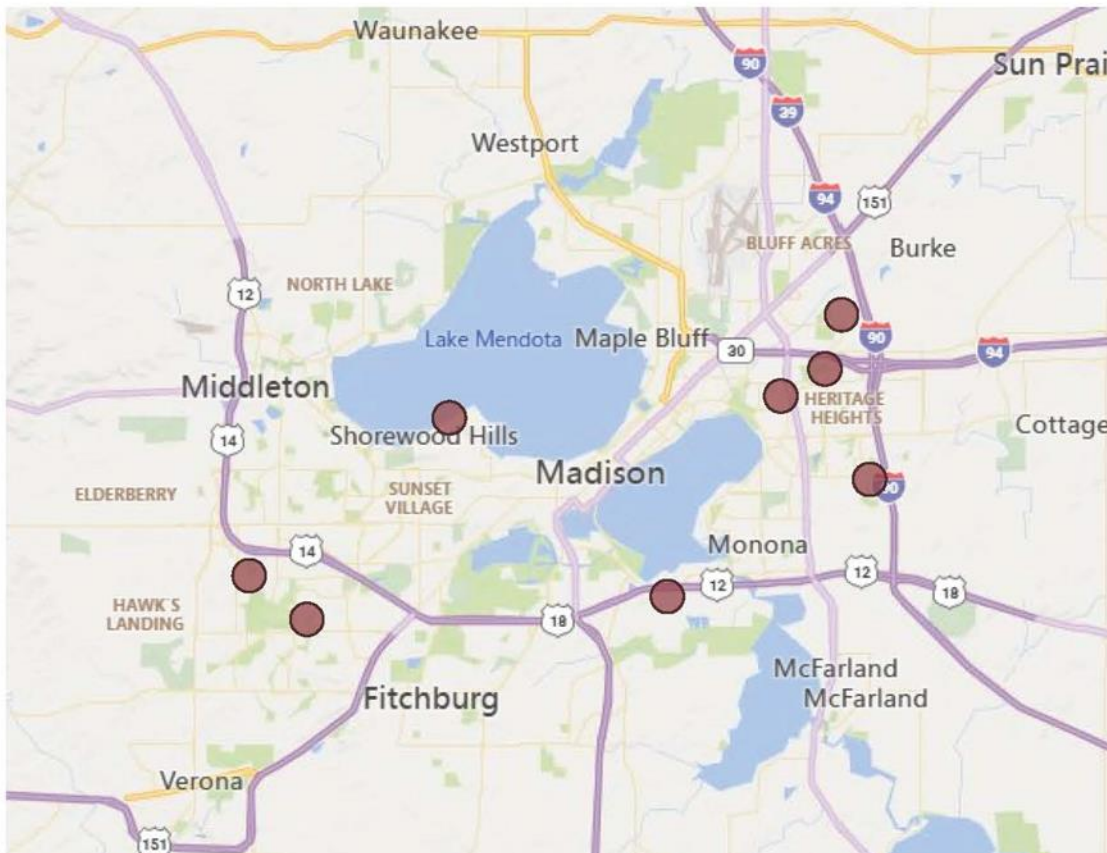
Over the past decade (2015 – 2024), the percentage of sampled sites with high levels of *Culex* mosquitoes has ranged from 4.8% to 10.9%; *Aedes* larvae activity ranged from 0.4% to 9% (Table 3). Seasonal variation in temperature and rainfall can impact findings.

Table 3: Percentage of sites with high levels of *Culex* and *Aedes* mosquitoes by year, 2015-2024

Year	<i>Culex</i>	<i>Aedes</i>
2015	9.4%	5.8%
2016	5.4%	3.9%
2017	10.9%	9.0%
2018	5.4%	6.2%
2019	6.7%	4.6%
2020	6.1%	2.7%
2021	9.0%	4.6%
2022	6.4%	3.5%
2023	5.2%	0.4%
2024	4.8%	3.6%
Average	6.9%	4.4%

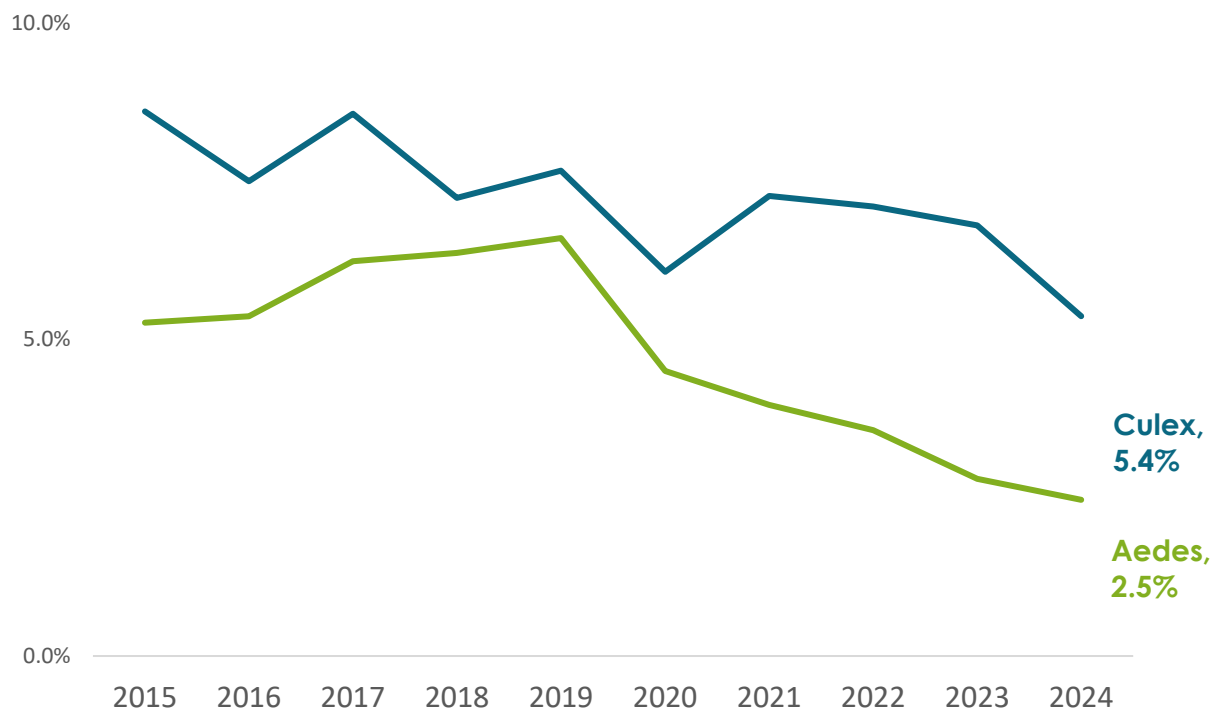
Between 2015 and 2024, a total of 186 unique sites were found to have high numbers of *Culex* larvae during at least one season. Of these, 33 sites (17.7%) had elevated *Culex* larvae in multiple seasons, occurring in four or more different years. Notably, eight of these sites had high *Culex* larvae counts every year throughout the entire ten-year period (Figure 2).

Figure 2: Inspection sites in Dane County reporting *Culex* larvae each year of the past decade, 2015 – 2024



We find *Culex* more often than we find *Aedes* (Figure 3), and the rate at which we find *Culex* or *Aedes* larvae has been decreasing over the past decade.

Figure 3: Percentage of sites with high levels of *Culex* and *Aedes* mosquitoes, 3-year rolling averages, 2015-2024

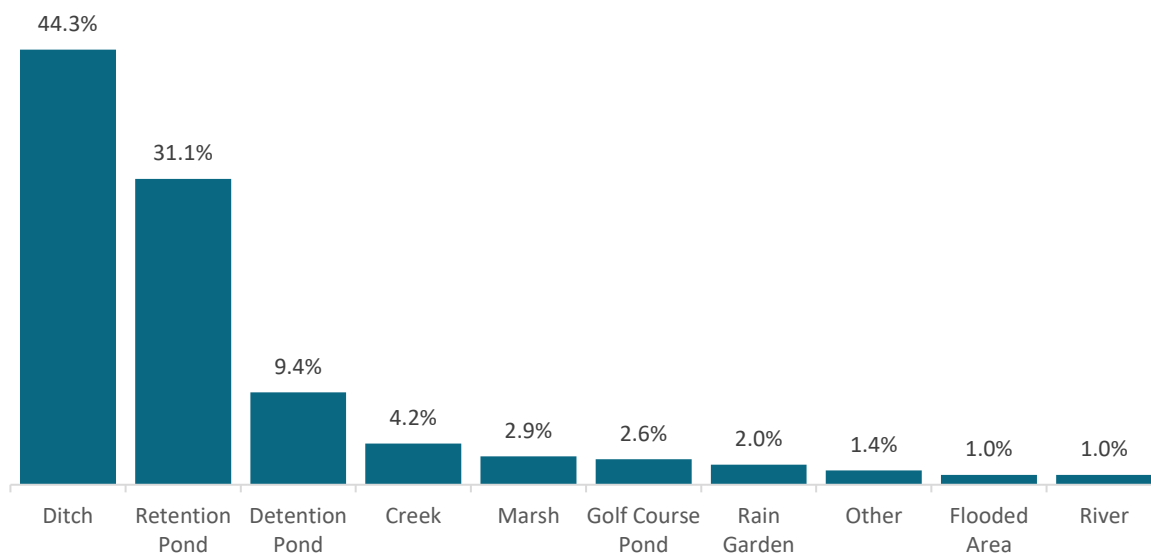


The types of sites with high numbers of larvae have remained generally consistent from year to year. Ditches, detention ponds, and retention ponds are the most common locations where mosquito larvae are found.

- Ditches are narrow open channels designed for drainage purposes to collect and carry excess water from fields, roadways, and low-laying areas.
- Detention ponds temporarily store stormwater runoff and then release it gradually until it is drained.
- Retention ponds are designed to permanently hold water. Retention ponds are less likely than ditches and detention ponds to host mosquitoes because these water bodies have much more stable edges and shallow pools are not prone to develop at these sites. In addition, the presence of natural predators including fish, tadpoles, and other insects at retention ponds make these sites a less suitable habitat for mosquito larvae in comparison to ditches and detention ponds.

In addition to these common sample sites, we also sample creeks, flooded areas, golf course ponds, inlets, marshes, rain gardens, riverbanks, and springs (Figure 4).

Figure 4: Site types sampled for mosquito larvae in Dane County, percentage of total inspections, 2015-2024



Larvicide applications

During the 2024 mosquito season, a total of 36 treatments were performed at 22 sites that reported high levels of *Culex* mosquito larvae. All treatments were effective in reducing larvae numbers below the treatment threshold of three larvae per dip when reassessed the week after a treatment. Larvicide applications are typically effective for one month. After that, a site may need additional treatment if elevated mosquito activity returns to the site. In the 2024 monitoring season, four sites were considered problematic and required treatment on 3 or more separate occasions during the season. Occasionally, some sites with high *Culex* activity were not treated due to weather and/or site conditions during reinspection that reduced mosquito activity and eliminated the need for larvicide application.

HOW TO PREVENT MOSQUITO-RELATED ILLNESSES

Mosquito-related illnesses, like West Nile, are preventable:

- Mosquitoes like to lay eggs in standing water. They don't need a lot, so be sure to keep things dry. Drain any standing water in your outdoor living areas. You might see water accumulating in clogged gutters, air conditioners, tarps, wheelbarrows, plant debris, flower pots, pet dishes, or birdbaths.
- Use insect repellents on skin and clothing before heading outdoors during mosquito season (May - October).
- Wear long-sleeved shirts, pants, socks, and shoes outside during peak mosquito activity hours.; usually dusk and dawn for most mosquito species in Wisconsin.
- Learn more on the [Department of Health Services website](#)

Appendix 1: Dane County sites with high numbers of *Culex* and/or *Aedes* larvae in 2024

This table below summarizes sites where elevated levels of *Culex* and *Aedes* mosquito larvae were found. Sites with elevated levels of *Culex* larvae were treated with larvicide. The results are also displayed in the following [map](#).

Site group name	Total for site		High <i>Culex</i> in site	High <i>Aedes</i> in site
	# sites	# Inspections	sites	sites
City of Madison				
Acewood Park	5	16	0	2
Atlas Avenue Retention Pond	1	12	0	1
Culvert drainage ditch	1	16	1	0
Dane County Airport	4	6	1	0
Ditch	1	3	0	1
East Badger Mill Creek Greenway	15	109	1	0
East Starkweather – East Towne Greenway	10	30	0	1
Eastmorland Park	3	19	1	1
Franklin Field	5	18	1	0
Highpoint Estates Detention Pond	1	16	1	0
International lane	1	6	1	0
MATC Traux Parking Lot	9	28	0	1
Milwaukee St. Greenway	6	39	2	1
Nob Hill Ponds	4	25	1	1
North Penito Creek Greenway	6	39	2	2
Rennebohm Park Detention Pond	1	5	1	0
Retention Pond	1	3	0	1

Ridgewood Ponds	2	18	1	0
Starkweather - Olbrich Greenway	10	36	1	1
Starkweather Creek	8	24	0	1
Sycamore Ave Detention Pond	1	13	1	0
UW CAMPUS	2	18	1	0
UW Research Park Ponds	7	23	1	0
Vilas Park	2	8	1	0
Warner park	8	33	2	0
Warner Park flood zone	1	5	1	0
Warner Park Lagoon	7	34	1	1
Westchester Gardens Park	3	18	1	1
Whitetail Ridge Detention Pond	1	15	1	0
Yahara Golf Course Ditch	1	3	0	1
Yahara Hills Golf Course	6	19	0	1
City of Middleton				
Esser Pond	3	11	1	0
Orchard Heights Park	12	49	4	2
City of Monona				
Winnequah Park	4	21	1	0
City of Sun Prairie				
Ditch	1	3	0	1
Lois Dr.	5	15	1	0
Shonas Highland	8	22	0	1
The Gardens at Willow Brook	1	3	0	1
UW Campus				
Triangle Marsh	1	3	0	1
University Bay Ditches	4	14	1	0
Village of Shorewood Hills				
Shorewood Hills Golf Course	1	4	0	1