WEST NILE SURVEILLANCE MAP DATA NOTES

Why we track mosquitoes

The West Nile Virus 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 in our community; and monitor and control the larvae of mosquitoes capable of carrying West Nile. The maps displayed on our dashboard contain the results of mosquito larvae monitoring.

Purpose of Map

The purpose of these maps is to provide results of mosquito larvae sampling in communities in Dane County. When we find mosquito larvae that have the potential to carry West Nile Virus, we treat the site with larvicide. People could use this information for a variety of purposes, including:

- Inform personal protective measures
- Understand how public health conducts vector control (i.e. larvicide)
- Monitor mosquito populations over time
- Evaluate effectiveness of interventions
- Public engagement and education
- Climate change studies

Data Included

The homepage of the dashboard displays the number of sites that were sampled for mosquito larvae in the past week, along with the number of those sites that were treated. For information on the number of human West Nile Virus cases in Dane county, please see our reportable disease data dashboard.

The "Weekly Results" page has a map that shows our most recent larvae monitoring results for each site we've sampled, the date that we most recently took samples at the site, the total number of visits we've made to the site so far in the current year, and whether the site has been treated during the current year. The result categories are:

- Larvae treated (red dots)
    - Mosquito larvae that can transmit West Nile Virus were found at high enough numbers to warrant treatment with a larvicide
    - High numbers of larvae mean 3 or more larvae per dip sample
- Larvae not treated (blue dots)
    - Mosquito larvae that do not transmit West Nile Virus were found, or
    - Mosquito larvae that can transmit West Nile Virus were found at levels below the threshold for treatment
- No larvae found (grey dots)
    - The site had no standing water, or
    - The site had water, but no mosquito larvae were found

- Inaccessible
    - The site could not be sampled due to physical obstacles such as new construction or unsafe terrain conditions

The “Annual Results” page has a map that shows all the sites we sampled during the previous year with the final result and the total number of visits for each site. The final results use a hierarchy with the above categories. If the site was ever treated for mosquito larvae in the previous year, it gets assigned the "Larvae treated" result, and so on down the list.

Data Source

These monitoring results are obtained by field staff who visit public sites to collect water samples, observe them for the presence of mosquito larvae, and use microscopes to identify the species of mosquito larvae in the environmental health lab. Water samples are collected using a tool called a “dipstick.” Each site will be dipped 2 – 10 times to collect a single water sample. Field staff monitor roughly 700 sites each month in Madison, Monona, Sun Prairie and Middleton between June and August.

Not all species of mosquito transmit West Nile Virus. In Dane county, the two mosquito species that are known to transmit West Nile Virus are *Culex pipiens* and *Culex restuans*. If a water sample contains three or more *C. pipiens* or *C. restuans* per dip, then the site will be treated with a larvicide called VectoLex FG. This larvicide only targets the larvae and prevents them from growing into adult mosquitoes that can bite and transmit West Nile Virus.

Sites sampled by field staff are non-recreational (not open for swimming or general use by the public), not used for drinking water, and are on publicly owned land. Examples of these sites include ditches, rain gardens, detention pond areas, and retention ponds. Different communities, such as Madison, Monona, Sun Prairie and Middleton, enter a cost sharing agreement with Public Health Madison & Dane County each summer to monitor these sites.

Map Update Schedule

This map is updated weekly between June and August. The map is updated on Monday and shows results for larvae monitoring from the prior week. Field staff sample sites Monday through Thursday and perform larvicide treatments as needed on Fridays. Data collected during the week is analyzed on Thursdays and Fridays so that results may be posted on Monday the following week. Each week, new monitoring results are added and overwrite existing results when each site is revisited for sampling or treatment confirmation by field staff.

Data Changes

Mosquito larvae monitoring results may change each week for several reasons. Some sites are known to have historically high mosquito activity and are sampled every week by field staff. Most sites are visited once a month. If a site does not have high numbers of mosquito larvae capable of carrying West Nile Virus, it generally is not sampled again until the next month. If a site is treated because it has high numbers of West Nile Virus carrying mosquitoes, it will be re-sampled the following week to see if any larvae remain after treatment. Sometimes weather conditions, such as heavy rain, interfere with the

ability of the treatment to work properly. In these instances, a site might show as “Larvae treated” for consecutive weeks. The treatment works for a period of approximately 30 days, so a site marked as “treated” in June may appear again in July or August as a treated site.

Data Interpretation and Context

Changes in the presence of larvae at a site can be the result of many things. Mosquitoes that can carry West Nile Virus are very poor swimmers who prefer sites with shallow, stagnant (non-moving) water. How much water a site holds will change throughout the summer due to variations in weather. A lack of rain could cause a site to temporarily dry up. Other times, excessive rainfall could cause a site to overflow or have a fast current that “flushes out” the mosquito larvae.

The amount of vegetation, or the presence of other animals, also changes the possibility of mosquito larvae at a site. The more vegetation that grows in and around the water, the less likely it is to have mosquito larvae. The presence of animals that eat mosquito larvae, like frogs, dragonflies, and fish, may also change at any given site throughout the summer. Even the presence of mosquito larvae that do not carry West Nile Virus can prevent mosquitoes capable of carrying West Nile Virus from existing at a site. Alongside weather, these factors are often the reason why a site may or may be treated.

Data Availability

If you wish to view this data in a different format, please submit a data request on our website. We may also be able to provide answers to additional questions you have by contacting us at lab@publichealthmdc.com.