

**West Nile Virus Surveillance in Madison and Dane County
2013**

2 January 2014

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Summary

- Bird surveillance did not report a positive result of West Nile virus (WNV) during 2013.
- A total of 72 sick or dead birds were reported in 2013; this included a total of 36 sick or dead crows and blue jays.
- The Public Health Department continued partnerships with other City of Madison agencies, six neighboring communities, and the University of Wisconsin campus to implement mosquito larvae monitoring and control activities in the Madison metropolitan area.
- Mosquito larvae monitoring determined that nearly 8.7% of water sources in the Madison metropolitan area produced high numbers of *Culex* mosquitoes at least once in 2013; another 3.6% produced high numbers of *Aedes* larvae.
- A total of 4 cases of WNV illness (2 confirmed and 2 probable) were reported among Dane County residents in 2013. No disease-related death was reported.

Bird Surveillance

In 2013, Public Health Madison and Dane County (PHMDC) cooperated with statewide efforts to collect and test dead crows and blue jays for WNV; two types of birds shown to be susceptible to West Nile infection and compose the majority of birds that test positive for the virus. Table 1 provides a summary of the sick or dead bird surveillance data. In the current reporting year, a total of 36 crows and blue jays were reported and/or collected; one bird were submitted for testing for WNV. All other reported dead birds were either not collected or unsuitable for testing. No positive results for WNV were reported from the testing of collected bird specimens.

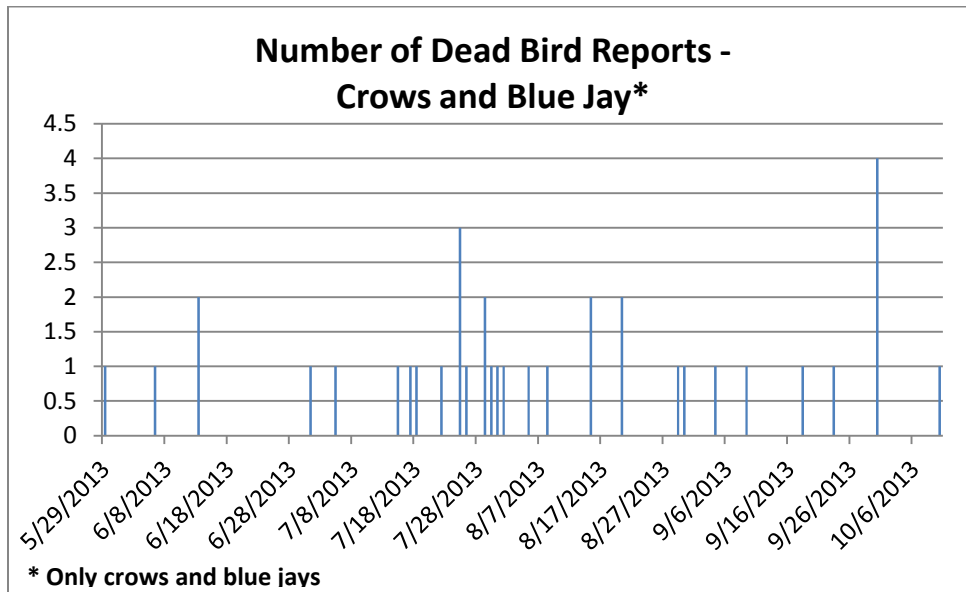
As in previous years, only a small percentage of the birds reported as sick or dead were collected for WNV analysis. In 2007, the Department changed procedures to focus on collecting sick birds. Prior to 2007, considerable effort was made to collect both sick and dead birds; however, we found that many dead birds reported for collection were not suitable for testing or clearly died from a cause other than WNV. Dead birds were still recorded during 2013 for monitoring purposes. Figure 1 shows the number and date of occurrence for all crows and blue jays reported and/or collected during the current reporting period. As demonstrated in the table above, the number of reported sick and dead bird (crows and blue jays) was significantly decreased compared to 2012 but consistent with the previous years of 2008 – 2011.

Table 1. Results of sick/dead bird (crows and blue jays) surveillance in Dane County.

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Date first bird reported	Apr 23	May 3	May 10	May 19	May 18	May 24	March 1	May 18	May 29
Date first WNV positive bird collected	May 19	Jun 5	Jun 13	Aug 6	N/A	N/A	Aug 9	Jul 9	N/A
Date WNV testing	Jun	Jun	Aug	Aug	Sep	Aug	Aug	Jul 9	Oct

discontinued for the year	7	19	21	28	5	10	9		10
Total # WNV positive birds	2	7	2	2	0	0	1	1	0
Total # birds collected	9	15	2	5	6	3	5	3	1
Total # of sick or dead crows and blue jays reported	283	365	106	55	17	8	26	213	36
Peak weekly average of sick/dead bird reports	8.4	5.2	1.9	1.4	0.4	0.3	0.9	5.6	0.7
Date of sick/ dead bird report peak	Aug 22	Aug 17	Jul 3	Jul 7	Aug 3	July 13	Aug 24	Aug 22	Sept 30

According to bird reports and displayed in the accompanying figure, WNV activity was low throughout the early months of the season and increased during the summer months (late July through August) and peaked in late July. The last report of the current season occurred on in early October 2013. The peak average reports per week (0.7 reports) during this reporting timeframe was greatly decreased compared to 2012 but more consistent with the results reported during 2008 – 2011 prior to the large increase recorded during the last monitoring season. No WNV positive results were reported in 2013 from tested birds.



Mosquito Surveillance

Similar to previous years, PHMDC continued its partnership with the Town of Madison, Village of Maple Bluff, City of Middleton, City of Monona, Village of Shorewood Hills, City of Sun Prairie, and the University of Wisconsin during 2013 to monitor and control the breeding activity of targeted mosquito species on public property. The primary targeted mosquito species of this annual surveillance is the *Culex* species due to its identification as the principal vector for human transmission of WNV and has accounted for the vast majority of WNV infected mosquitoes captured throughout the country. If present, other potential mosquito species that deemed potential vectors for WNV are also monitored; in Dane County, this primarily includes the *Aedes* mosquito species. Mosquito control involved public outreach to promote removal of water sources (source reduction) and larvicide applications when water sources were found to produce high levels of target mosquito larvae; *Culex* and/or *Aedes* mosquito species. Overall, during the 2013 mosquito season, a total of 64 treatments were performed at 48 sites that

reported high levels of mosquito larvae; six additional treatments were scheduled but cancelled due to weather or site conditions that prevented effective treatment or eliminated the need for treatment. The table below (Table 2) lists the number of sites by community that reported high concentrations of *Culex* or *Aedes* larvae; all other sites tested reported either low concentrations that did not require treatment or no larvae detected.

Table 2. Summary results of 2013 mosquito larvae inspections of accessible sources in the Madison metropolitan area.

	City of Madison	Village of Maple Bluff	City of Middleton	City of Monona	Village of Shorewood Hills	City of Sun Prairie	Town of Madison	UW Madison	Total Metro Area
High <i>Culex</i>	33	0	9	0	0	6	1	1	50
High <i>Aedes</i>	16	0	3	0	0	2	0	0	21
# of inspected sites	356	1	63	20	1	100	10	26	577
% High <i>Culex</i>	9.3%	0.0%	14.3%	0.0%	0.0%	6.0%	1.0%	3.8%	8.7%
% High <i>Aedes</i>	4.5%	0.0%	4.8%	0.0%	0.0%	2.0%	0.0%	0.0%	3.6%

During 2013, department staff made 1,896 inspections of 577 sites in the metro area. Similar to previous years, the bulk of these inspections were made at ditches and detention/ retention ponds (39.5% and 41.4%, respectively); however, other sites evaluated included, but not limited to, creeks, marshes, rivers, and rain gardens. In the metro area, 8.7% of all inspected sites produced high number of *Culex* larvae at least once during surveillance (approximately May through August); 3.6% of inspected sites produced high numbers of *Aedes* larvae. No other mosquito species was found in high numbers.

At the community level, the City of Middleton reported the largest percentage of sites with high numbers of *Culex* larvae (14.3%); high concentrations were also reported at sites in the Cities of Madison (9.3%) and Sun Prairie (6.0%) and at inspected University of Wisconsin sites (3.8%). The City of Middleton also reported the largest percentage of sites with high numbers of *Aedes* larvae (4.8%) but high numbers were also reported in the Cities of Madison (4.5%) and Sun Prairie (2.0%).

For additional information on these efforts for 2013, please refer to the full mosquito monitoring and control program reports for these years entitled "Mosquito Monitoring and Control – Madison Metropolitan Area"; a separate report is available for each year. These reports are available at: <http://www.publichealthmdc.com/>.

Human Surveillance

Most humans (~80%) infected with WNV experience no adverse symptoms and less than 1% will have serious encephalitis or meningitis result from infection. As of December 31, 2012, a total of 37,088 cases of the disease had been reported in the United States, including 681 cases reported in Wisconsin. Preliminary data totals in 2013 (as of December 3, 2013) have reported a total of 2,318 cases of human WNV (1,171 cases of neuroinvasive disease and 1,147 cases of non-neuroinvasive disease) including 105 deaths attributed to the disease; these disease-related deaths composed 4.5% of all cases currently reported during this year and 50.5% of

those with neuroinvasive disease. A slight decrease in human disease compared to the 2012 reporting period (5,674 cases and 286 deaths).

West Nile virus infection is a reportable illness in Wisconsin. PHMDC continues to conduct passive surveillance for human cases of WNV infection at the county level. Area providers are also encouraged to participate in Wisconsin’s Enhanced Arbovirus Surveillance program, which tests serum and cerebrospinal fluid of patients who met specific clinical criteria. In 2012, a total of 57 cases were reported statewide including 4 deaths. Preliminary data for 2013 has reported 21 cases of the disease and 2 deaths. Since 2002, surveillance has recorded a total of 21 cases of human WNV infection (probable and confirmed) in Dane County. A breakdown of these cases is given in Table 3 below.

Table 3. Number of human WNV cases in Dane County.			
	Cases Identified		
	2012	2013	Total since 2002
WNV Fever	2	2	12
WNV Encephalitis (non-fatal)	3	2	9
WNV Encephalitis (fatal)	0	0	2
Total	5	4	23

Public Outreach

At the beginning of each of the seasons reported above, a press release was issued that provided a written briefing to educate the media. In addition, PHMDC staff continued efforts to provide information to the public including the risks of WNV illness, mosquito bite prevention, the reduction of mosquito-breeding areas, and an annual report of WNV and mosquito activity in the county. This and additional information is available on the PHMDC website (<http://www.publichealthmdc.com/disease/westNile/>).

Conclusion

West Nile virus surveillance activities continue to indicate that WNV risk for humans in Madison and Dane County is low but there are still areas that continue to report high level of *Culex* and/or *Aedes* mosquitoes. No positive cases of WNV activity were found in the dead birds collected for surveillance; four cases of WNV (2 confirmed and 2 probable) were reported in humans in 2013. Although the documented levels of WNV activity had decreased in comparison to 2012 the number of bird reports was consistent with 2008 – 2011 monitoring seasons. Despite these findings, low numbers of mosquito impacted water sites and human cases of WNV infection are typically reported in the City of Madison and Dane County. Due to this level of annual activity, the collection of sick and dead bird reports continues to be the Department’s best measure of WNV activity in the area. Adult mosquito surveillance also continues to be an important tool for measuring overall mosquito activity.

Based on activity trends demonstrated in the data over the past decade, we can expect at least a low level of WNV infection in mosquitoes, birds, and humans in the future. Continued surveillance efforts are necessary to assess the intensity of this illness in our communities and provide recommendations on addressing the threat of illness. Program efforts planned for 2014 will continue to include:

- ❏ Dead and sick bird surveillance and testing identifies when the virus is active in the community and provides a measure of severity between years.
- ❏ Mosquito larvae monitoring and control detects standing water that may provide breeding opportunity for WNV competent mosquitoes and provides a mechanism for responding to sites on public property shown to produce high numbers of mosquitoes. This also provides an example for area residents to follow in preventing water sources on their property from producing mosquitoes.
- ❏ Adult mosquito surveillance provides information on the level of mosquito activity.
- ❏ Human illness surveillance detects when WNV activity has moved from bird populations to humans.