

MANITOBA HEALTH, SENIORS AND ACTIVE LIVING

WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 28)

The weekly 'West Nile Virus Surveillance Report' outlines the most current surveillance data and is posted weekly on the website (www.gov.mb.ca/health/wnv) during the summer season. Surveillance data are subject to change and will be updated accordingly as new information becomes available.

Manitoba Health, Seniors and Active Living (MHSAL) conducts surveillance for West Nile virus (WNV) within human, mosquito & horse populations annually:

- **Mosquito:** Mosquito surveillance is conducted twice per week between mid-May and mid-September (weather dependent) in a number of southern Manitoba communities. In Manitoba WNV testing is conducted on *Culex tarsalis* mosquitoes, the principal vectors of WNV, and both mosquito numbers and infection rates (i.e. positive mosquito pools*) are reported.
 - Communities chosen for mosquito trap placement were selected based on population density, local evidence of prior WNV activity and representative geographic distribution.
- **Human:** Human WNV surveillance is conducted throughout the year (January – December) by Cadham Provincial Laboratory and Canadian Blood Services, with all data reportable to MHSAL.
 - Human cases are included in the Weekly WNV Surveillance Report based on the date they are reported to MHSAL. Case classification information is not included in this report but can be found on the website (www.gov.mb.ca/health/wnv/stats.html).
- **Horse:** Surveillance of WNV in horses is conducted by Manitoba Agriculture with cases reported to MHSAL as detected.

The risk of WNV transmission is expected to be present throughout southern Manitoba each year and mosquito trapping provides a localized estimate of WNV risk. The absence of traps in a community or region does not imply that there is no risk of WNV in those locations. Further, low *Culex tarsalis* numbers and/ or infection rates should not be interpreted as zero risk. Residents and visitors are strongly encouraged to protect themselves from mosquito bites throughout the season even in areas with no mosquito traps or low WNV activity.

The accumulation of Degree Days* are recorded throughout the season as there is a general correlation between increased and/ or rapid accumulation of Degree Days and WNV transmission risk. Warmer temperatures associated with increased Degree Days serve to decrease mosquito development times, shorten the WNV incubation period and increase biting activity. All of which can increase the risk of WNV transmission, should other conditions also be favourable. Seasonally the greatest accumulation of Degree Days typically occurs in the southwestern portion of the province and along the Red River valley.

For additional West Nile virus information, including precautionary measures and symptoms, please consult the MHSAL WNV website (www.gov.mb.ca/health/wnv) or contact Health Links at 204-788-8200 (in Winnipeg) or toll free at 1-888-315-9257.

*** For a more detailed description off mosquito pools & degree days consult Appendix 2.**

- WNV Provincial Surveillance Data -

- To date (as of week 28*) there has been no WNV activity detected in Manitoba (Figure 1).
- *Culex tarsalis* activity increased during Week 28, with mosquitoes collected from all but one of the 29 sentinel communities spread across all four southern Manitoba Health Regions (Table 1 & 2; Figure 2). Numbers increased most notably in the Southern Health Region.

* For a listing of CDC surveillance weeks and corresponding dates for the 2016 please see Appendix 1.

2015 Year-End WNV Surveillance Data*	
○	In 2015 a total of 5 human WNV cases were reported to Manitoba Health, Seniors and Active Living from three southern Manitoba Health Regions (Interlake-Eastern, Southern and Winnipeg).
○	Four (4) of the WNV human cases were classified as the less severe non-neurological syndrome, while one was classified as the more severe neurological syndrome and required hospitalization. <ul style="list-style-type: none"> ○ Four of the WNV human cases had likely exposure between July 26 and August 22, 2015 – coinciding with peak <i>Culex tarsalis</i> activity and infection rates.
○	In 2015 a total of 30 WNV positive mosquito pools were collected from 14 communities distributed across all four southern Manitoba Health Regions (Interlake-Eastern, Prairie-Mountain, Southern and Winnipeg). <ul style="list-style-type: none"> ○ More than half of the positive mosquito pools were collected from the Southern Health Region.
○	In 2015 a single WNV positive horse was reported from the Prairie Mountain Health Region.
○	There were no WNV positive birds reported in 2015.

Table 1 – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to week 28)

Health Region	CDC Week										
	21	22	23	24	25	26	27	28	29	30	31
Interlake-Eastern	0.00	0.08	0.00	0.00	1.50	3.73	2.06	5.37			
Prairie Mountain	0.00	0.00	0.00	0.03	1.41	0.63	5.85	13.10			
Southern	0.04	0.15	0.04	0.15	3.57	4.68	6.36	31.60			
Winnipeg	0.06	0.08	0.06	0.53	0.88	2.58	9.11	14.20			
Provincial Average	0.03	0.08	0.03	0.19	2.05	2.80	6.20	18.01			
	Indicates that one or more positive mosquito pools were detected within the health region.										

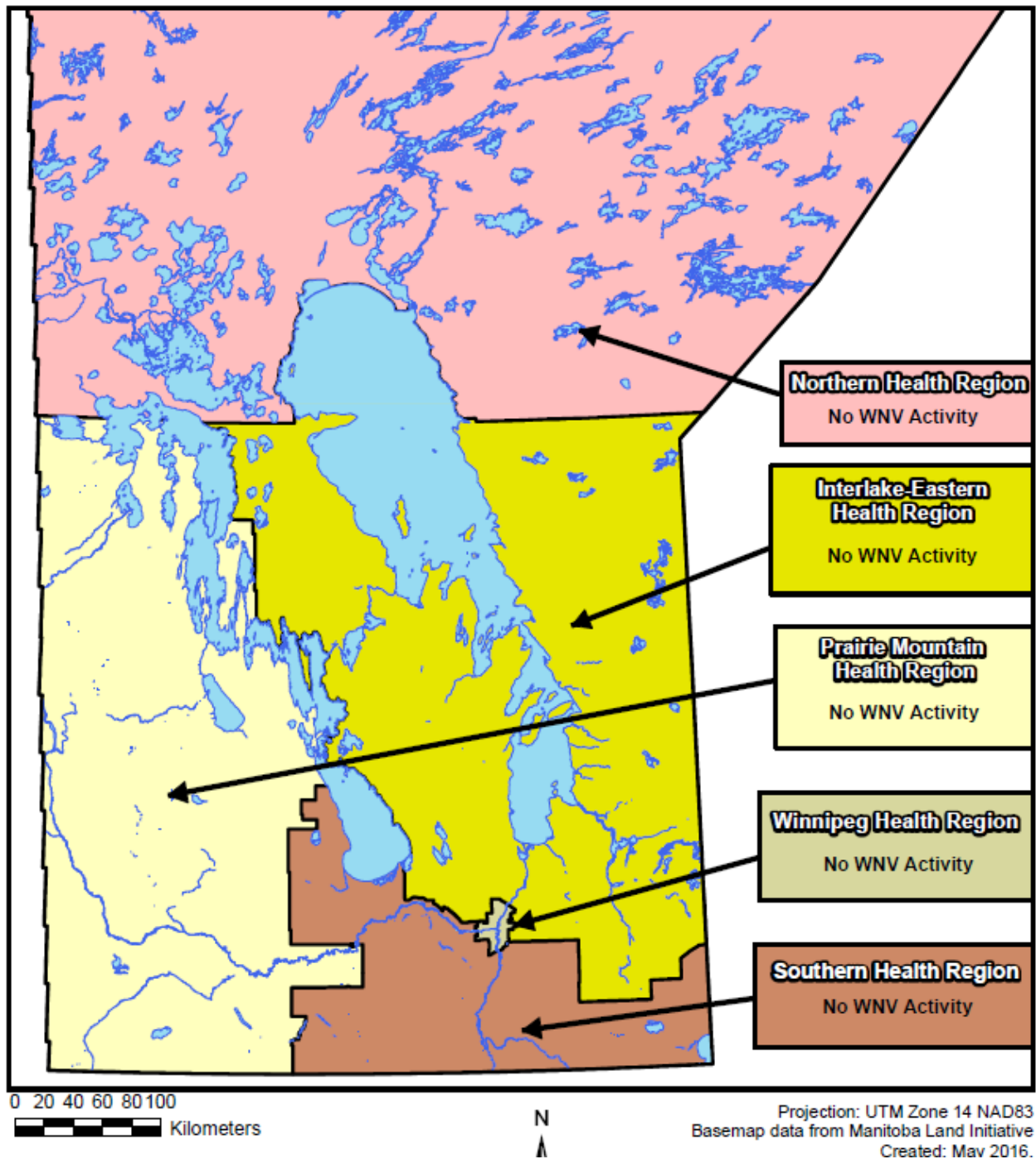


Figure 1 – WNV activity by Health Region within Manitoba (current to week 28).

Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community* in southern Manitoba – three week trend (current to week 28).

Health Region	Community	Week 28	Week 27	Week 26
Interlake-Eastern	Beausejour	1.50	0.75	0.00
	Gimli	0.75	0.00	21.50
	Oakbank	0.00	0.33	0.00
	Selkirk	10.75	0.00	0.00
	Stonewall	12.50	8.25	4.33
Prairie Mountain	Boissevain	30.00	16.25	2.00
	Brandon	2.80	0.22	0.10
	Carberry	11.75	6.00	0.00
	Dauphin	0.33	0.00	0.00
	Killarney	39.25	31.00	0.25
	Minnedosa	1.00	0.00	0.33
	Sioux Valley FN	41.00	3.75	1.50
	Souris	3.25	0.50	1.00
	Virden	5.00	2.00	1.25
Southern	Altona	64.00	3.75	10.00
	Carman	8.25	3.25	0.00
	Headingley	3.00	0.50	0.50
	Morden	18.25	4.75	9.00
	Morris	15.75	3.00	1.50
	Niverville	10.33	0.75	3.00
	Portage la Prairie	1.33	5.75	2.00
	Roseau River FN	58.75	8.00	10.00
	Ste. Anne	1.00	3.00	0.25
	Sandy Bay FN	1.00	1.75	1.50
	Steinbach	2.75	2.50	1.00
	Winkler	168.00	36.75	15.50
Winnipeg	East St Paul	9.00	4.00	10.50
	West St Paul	22.00	56.00	1.00
	Winnipeg	14.03	7.50	2.14
	Indicates that one or more positive mosquito pools were detected within the community.			

* Top three communities with the highest weekly average of *Culex tarsalis* are indicated in bold.

** Adult mosquito trapping started during CDC Week 21.

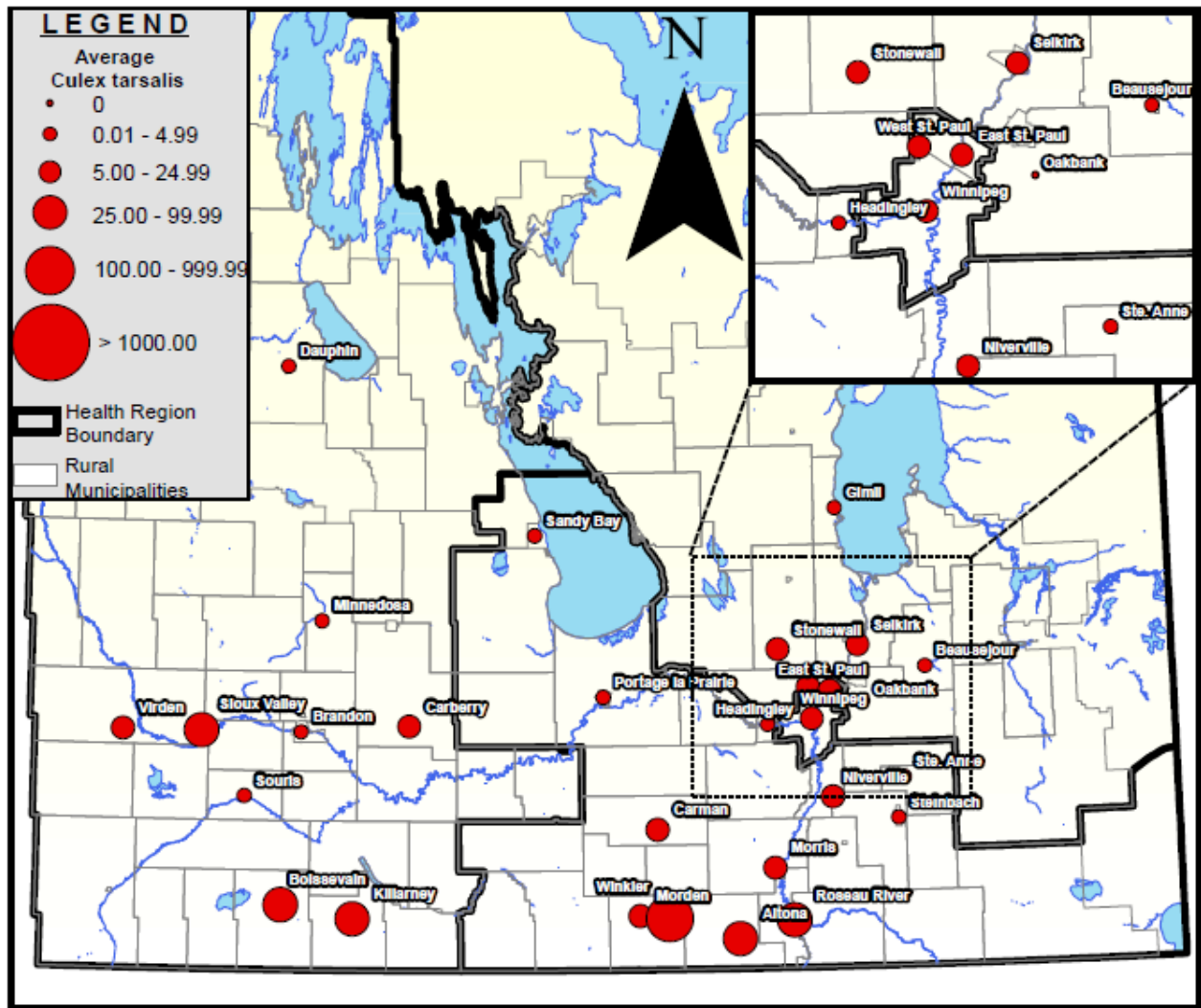
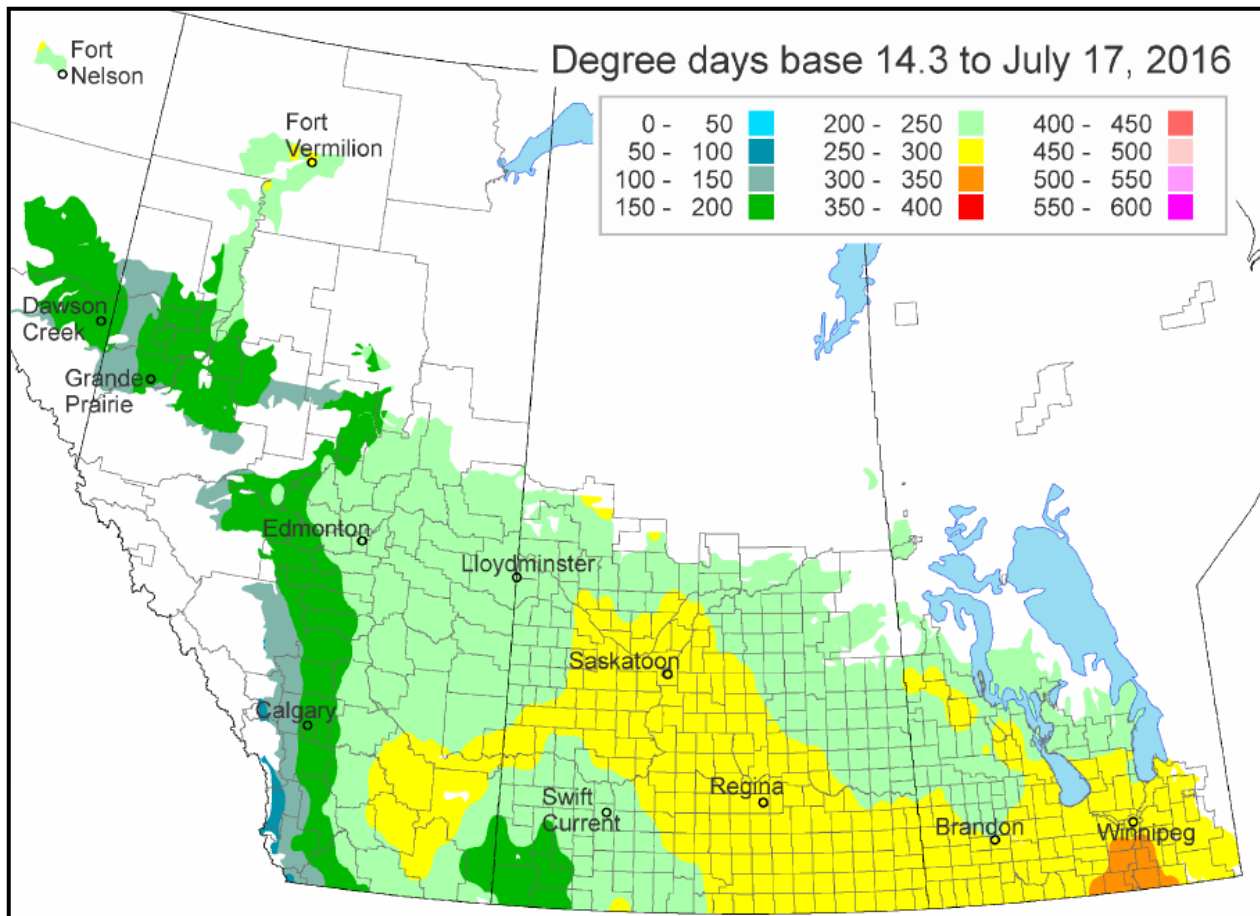


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during week 28.



Source: Map produced courtesy of Agriculture and Agri-Food Canada's Prairie Pest Monitoring Network.

Figure 3 - Degree day accumulations, as of Week 28, across the Prairie Provinces.

Table 3 – Total number of human WNV cases*, by Health Region of residence, reported to Manitoba Health, Seniors and Active Living by laboratories (current to week 28).

Health Region	CDC Week											Totals
	21	22	23	24	25	26	27	28	29	30	31	
Interlake-Eastern	0	0	0	0	0	0	0	0				0
Prairie Mountain	0	0	0	0	0	0	0	0				0
Southern	0	0	0	0	0	0	0	0				0
Winnipeg	0	0	0	0	0	0	0	0				0
Totals	0	0	0	0	0	0	0	0				0

* Note that cases are presented by week reported to MHSAL, adjustments may be made as more details (such as exposure CDC week) become available through follow-up investigation.

Table 4 – Total number of *Culex tarsalis* mosquito pools tested during the 2016 season by health region (current to week 28)

RHA	CDC Week											Totals
	21	22	23	24	25	26	27	28	29	30	31	
Interlake-Eastern	0	1	0	0	6	3	5	10				25
Prairie Mountain	0	0	0	1	16	14	19	31				81
Southern	2	4	1	6	25	22	29	35				124
Winnipeg	2	3	2	10	9	19	16	24				85
Weekly Totals	4	8	3	17	56	58	69	100				315

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to week 28)

Health Region	CDC Week											Totals
	21	22	23	24	25	26	27	28	29	30	31	
Interlake-Eastern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)				0 (0)
Prairie Mountain	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0(0)	0(0)				0 (0)
Southern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)				0 (0)
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)				0 (0)
Weekly Totals	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)				0 (0)

* Note that numbers outside brackets represent positive pools, numbers within represent the percentage of total pools that tested positive for WNV.

Table 6 – Comparison of year-to-date cumulative and year-end total West Nile virus in Manitoba (current to week 28)

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
2016	0	0	TBD	TBD
2015	1	0	30	5
2014	0	0	24	5
2013	1	0	19	3
2012	5	5	116	39
2011	0	0	0	0
2010	2	0	20	0
2009	0	0	2	2
2008	0	1	41	12
2007	185	36	948	587
2006	4	7	171	51
2005	13	6	193	58
2004	0	0	57	3
2003	16	1	290	143

- WNV Activity in Canada and the U.S. -

Canada:

- As of week 28 there have been two (2) WNV positive mosquito pools reported in Canada, one each from Ontario and Quebec (Table 7).
- Additional up to date Canadian WNV information can be obtained by consulting the Public Health Agency of Canada West Nile virus website at <http://healthycanadians.gc.ca/diseases-conditions-maladies-affections/disease-maladie/west-nile-nil-occidental/surveillance-eng.php>

United States:

- As of Week 28, WNV activity has been reported from a number of areas in the United States (Table 7).
 - As of Week 28 North Dakota is reporting two (2) WNV positive human cases, eleven (11) WNV positive mosquito pools and six (6) WNV positive birds (Table 7).
 - As of Week 28 South Dakota is reporting seven (7) WNV human cases, including one (1) viremic blood donor, and nine (9) WNV positive mosquito pools (Table 7).

- Additional up to date U.S. WNV information can be obtained by visiting the United States Geological Survey's 'Arbonet – Website' at <http://diseasemaps.usgs.gov/mapviewer/>

Table 7 – Positive human, mosquito, horse and bird West Nile Virus surveillance indicators across Canada and neighbouring US states as of Week 28.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds
Manitoba	0	0	0	0
Saskatchewan	0	1	0	0
Alberta	0	N/A**	0	N/A
North Dakota	2	11	0	6
South Dakota	7	9	0	0
Minnesota	0	0	0	0
Ontario	0	1	0	0
British Columbia	0	N/A	0	0
Quebec	0	1	0	0
Maritimes	0	N/A	0	N/A
TOTAL	9	23	0	6

* Table numbers include travel related cases.

** Jurisdictions with N/A (not applicable) do not maintain regular surveillance.

*** Veterinary cases are primarily, but not all, horse cases.

- APPENDIX 1 -

Table 8 – 2016 CDC surveillance weeks

CDC Week Number	Dates	CDC Week Number	Dates
21	May 22 - May 28	30	July 24 - July 30
22	May 29 - June 4	31	July 31 - August 6
23	June 5 - June 11	32	August 7 - August 13
24	June 12 - June 18	33	August 14 - August 20
25	June 19 - June 25	34	August 21 - August 27
26	June 26 - July 2	35	August 28 - September 3
27	July 3 - July 9	36	September 4 - September 10
28	July 10 - July 16	37	September 11 - September 17
29	July 17 - July 23	38	September 18 - September 24

- Appendix 2 -

Average number of *Culex tarsalis* – This weekly value provides an estimate of the *Culex tarsalis* numbers and activity. The potential risk of WNV transmission is greater when more *Culex tarsalis* are present – should the virus itself be present and other conditions prove favorable. It is calculated by dividing the total number of *Culex tarsalis* mosquitoes captured in the specified area by the total number of trap nights for the week (a trap night is recorded for each night that a trap was operational).

EXAMPLE: 120 *Culex tarsalis* collected; 2 traps operating on 2 nights (= 4 trap nights);
Average number = 120 (*Culex tarsalis*)/ 4 trap nights = 30.0

Degree Day – Degree days are a measurement of heat accumulation. The threshold temperature below which West Nile virus development does not occur (when in mosquitoes) is 14.3°C. Degree days are calculated by taking the daily mean temperature and subtracting the cut-off threshold:

EXAMPLE: Mean Temperature = 19.3°C; Degree Day threshold = 14.3°C; 19.3 – 14.3 = 5.0 Degree Days.

During the season a running total of accumulated Degree Days is recorded. It is generally assumed that a total of 109 Degree Days are required for virus development to be completed and potential transmission to occur. The risk of transmission increases with increasing Degree Day accumulation. Moreover, consistently warmer temperatures will significantly shorten virus development time thereby increasing the potential risk of WNV transmission – should the virus itself be present and other conditions prove to be favorable.

Mosquito Pool – Mosquitoes of the same species, collected from the same trap on the same date are pooled together for the purposes of laboratory testing. *Culex tarsalis* mosquitoes collected from one trap on a given night are placed in pools of 1 – 50 mosquitoes for WNV testing. When more than 50 *Culex tarsalis* mosquitoes are collected from the same trap multiple pools are tested. Thus a positive pool refers to the detection of WNV in between 1 – 50 *Culex tarsalis* mosquitoes collected from a given trap.