

# **Manitoba Weekly**

## **West Nile virus**

### **Surveillance Report**

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**Week 36 & 37 – (September 2 – September 8  
and September 9 - 15, 2018)**

Communicable Disease Control

Public Health Branch

Active Living, Indigenous Relations, Population &

Public Health Care Division

**Manitoba Health, Seniors and Active Living**

Released: September 14, 2018

## **About the Surveillance Report**

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](http://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](http://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<sup>1</sup> 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](http://www.gov.mb.ca/health/wnv)) or contact Health Links at 204-788-8200 (in Winnipeg) or toll free at 1-888-315-9257.

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<sup>1</sup> For more detailed description of mosquito pools and degree days please consult **Appendix 2**.

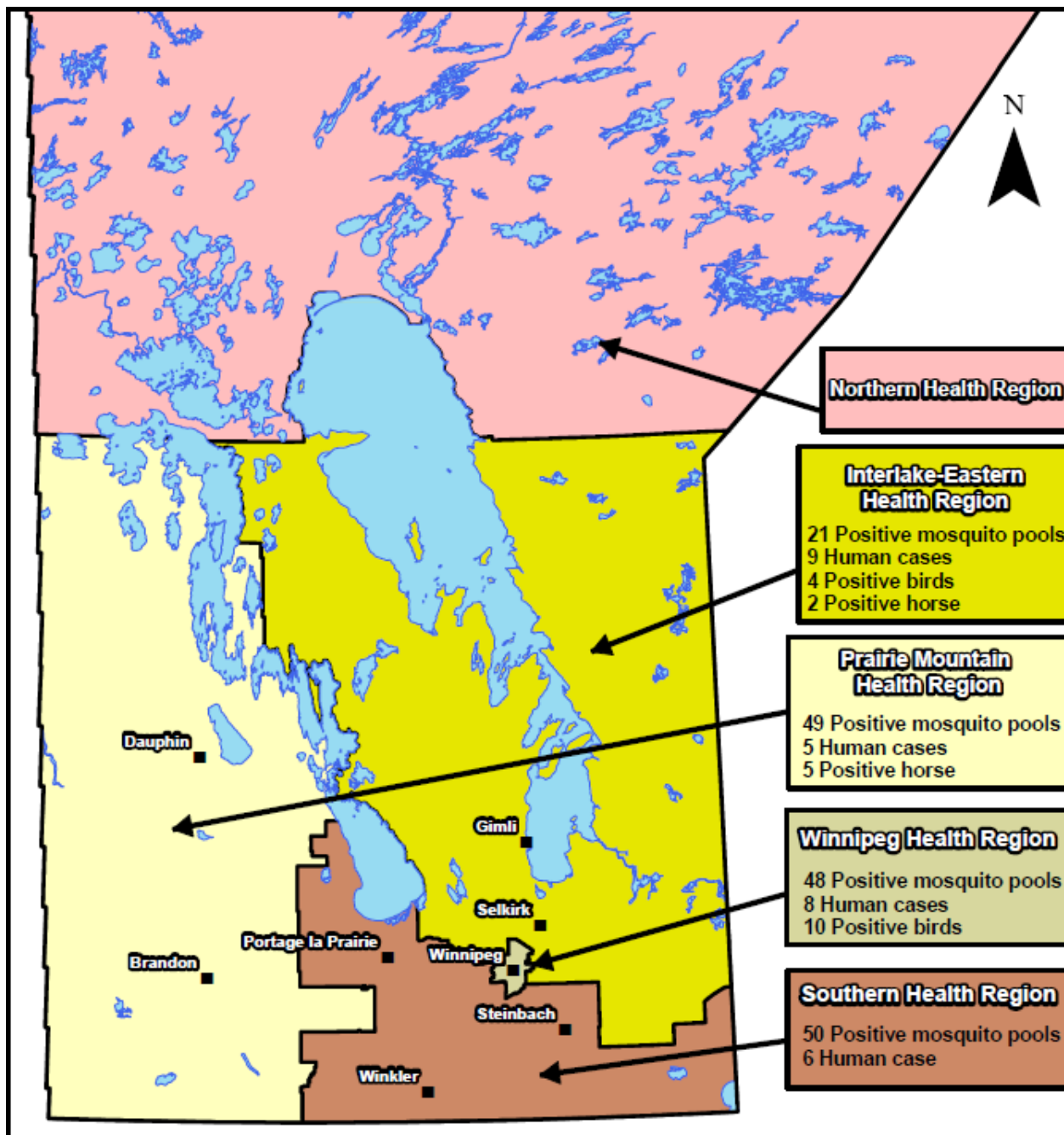
## **WNV Provincial Surveillance Data**

- During Week 36\* (September 2 – September 8) MHSAL detected five (5) additional human WNV cases, bringing the season total to date to twenty-eight (28).
  - Case classification have been revised based on further information. One case has been classified as WNV Neurological Syndrome, three as WNV Non-Neurological Syndrome and one as Asymptomatic. Twenty-three cases remain under investigation pending additional information.
- During Week 36, MHSAL detected one (1) additional WNV positive *Culex tarsalis* mosquito pool, bringing the total to date this season to one-hundred and sixty-eight (168) (Figure 1 & 3, Table 1).
  - The positive pool was collected from the Prairie Mountain (Virden) Health Region.
- In Week 36 *Cx. tarsalis* activity was recorded in all four southern Manitoba Health Regions and activity was similar to that observed in Week 35. Traps were only operated in twenty-four communities, and *Cx. tarsalis* activity was only recorded in thirteen (Figure 1, Table 1).
  - *Cx. tarsalis* activity and infection rates was highest in the Winnipeg Health Region (0.94 *Cx. tarsalis*/ trap night in Week 36. The infection rate was highest in the Prairie Mountain Health Region in Week 36 (11.1%).
- Fourteen (14) WNV positive birds (Interlake-Eastern and Winnipeg Health Regions) and seven (7) WNV positive horses (Interlake-Eastern Health Region and Prairie Mountain Health) have also been reported this season.
- Week 37 (September 9 – 15) was the final trapping weekend of the 2018 season. Traps were run in thirteen (13) communities. *Cx. tarsalis* activity was only detected in seven communities in three southern Manitoba Health regions (Figure 1, Table 1). Overall numbers were lower in Week 37 compared to Week 36 and there were no WNV positive pools.

\* For a listing of CDC surveillance weeks and corresponding dates for 2018 please see Appendix 1.

**Table 1** – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to Week 37)

Health Region	CDC Week								
	29	30	31	32	33	34	35	36	37
Interlake-Eastern	182.65	58.84	19.58	23.74	20.22	2.10	0.26	0.10	0.00
Prairie Mountain	139.15	80.83	20.60	57.57	108.19	20.45	1.08	0.82	0.50
Southern	57.70	84.64	23.60	31.20	20.48	8.37	0.65	0.31	0.23
Winnipeg	64.11	96.94	34.98	26.50	25.11	15.97	0.53	0.94	0.22
Provincial Average	101.60	83.17	26.10	36.96	48.35	12.82	0.69	0.65	0.28
Historical Avg	99.27	234.27	251.73	118.00	68.70	34.02	6.40	3.59	
	Indicates that one or more positive mosquito pools were detected within the health region.								

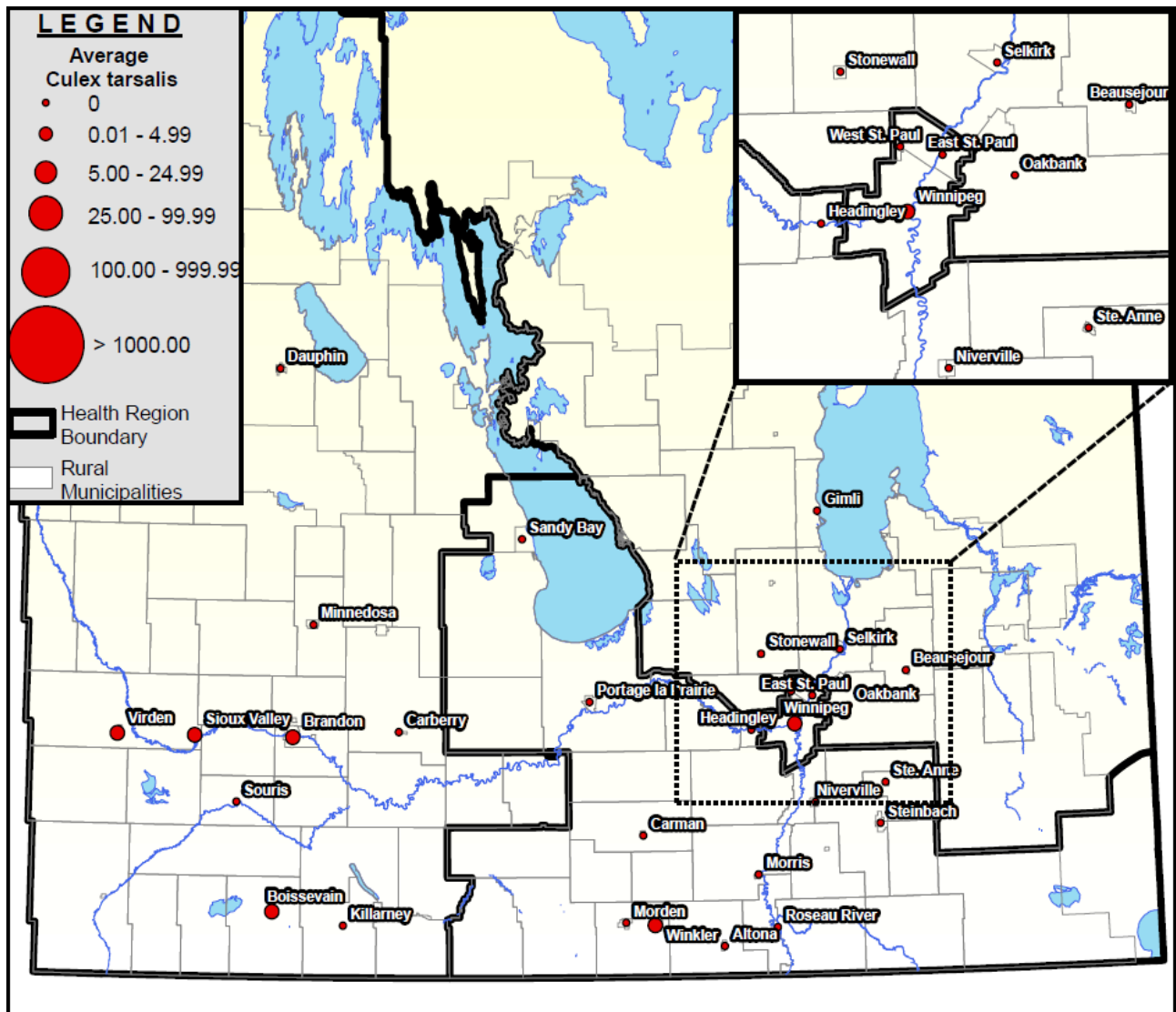


**Figure 1** – WNV activity by Health Region within Manitoba (current to Week 37).

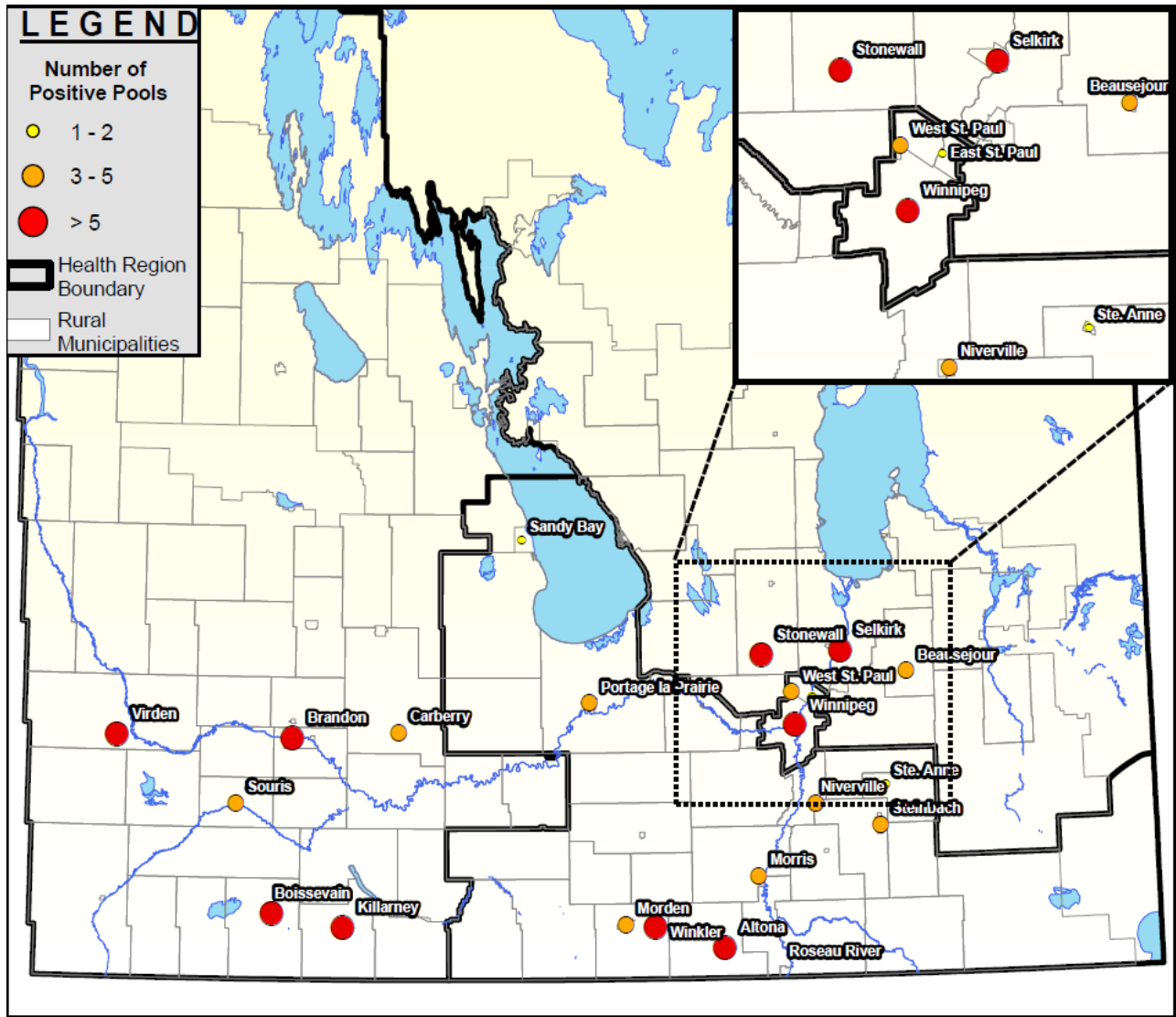
**Table 2 – Average number and proportion of *Culex tarsalis* mosquitoes collected by surveillance community\* in southern Manitoba – three week trend (current to Week 37).**

Health Region	Community	Week 37		Week 36	
		Avg # of <i>Cx. tarsalis</i>	Proportion of <i>Cx. tarsalis</i>	Avg # of <i>Cx. tarsalis</i>	Proportion of <i>Cx. tarsalis</i>
Interlake-Eastern	Beausejour	No Trapping	No Trapping	0.00	0.00
	Gimli	No Trapping	No Trapping	No Trapping	No Trapping
	Oakbank	No Trapping	No Trapping	No Trapping	No Trapping
	Selkirk	0.00	0.00	0.00	0.00
	Stonewall	0.00	0.00	0.25	0.24
Prairie Mountain	<b>Boissevain</b>	<b>0.50</b>	25.00	<b>5.50</b>	42.31
	<b>Brandon</b>	<b>0.60</b>	37.50	0.40	14.29
	Carberry	No Trapping	No Trapping	0.25	14.29
	Dauphin	No Trapping	No Trapping	No Trapping	No Trapping
	Killarney	No Trapping	No Trapping	0.00	0.00
	Minnedosa	No Trapping	No Trapping	0.00	0.00
	Sioux Valley FN	0.25	2.86	0.25	3.33
	Souris	No Trapping	No Trapping	0.00	0.00
	<b>Virden</b>	<b>0.50</b>	22.22	<b>0.75</b>	25.00
Southern	Altona	0.00	0.00	0.33	4.00
	Carman	No Trapping	No Trapping	0.00	0.00
	Headingley	0.00	0.00	0.00	0.00
	Morden	No Trapping	No Trapping	0.50	11.76
	Morris	No Trapping	No Trapping	0.00	0.00
	Niverville	No Trapping	No Trapping	No Trapping	No Trapping
	Portage la Prairie	No Trapping	No Trapping	<b>1.00</b>	11.11
	Roseau River FN	No Trapping	No Trapping	0.75	7.14
	Ste. Anne	No Trapping	No Trapping	0.00	0.00
	Sandy Bay FN	No Trapping	No Trapping	No Trapping	No Trapping
	Steinbach	0.25	100.00	No Trapping	No Trapping
	<b>Winkler</b>	<b>0.50</b>	20.00	0.00	0.00
	Winnipeg	East St Paul	0.00	0.00	<b>1.00</b>
West St Paul		0.00	0.00	0.50	3.13
Winnipeg		0.25	12.12	0.97	16.67
	Indicates that one or more positive mosquito pools were detected within the community.				

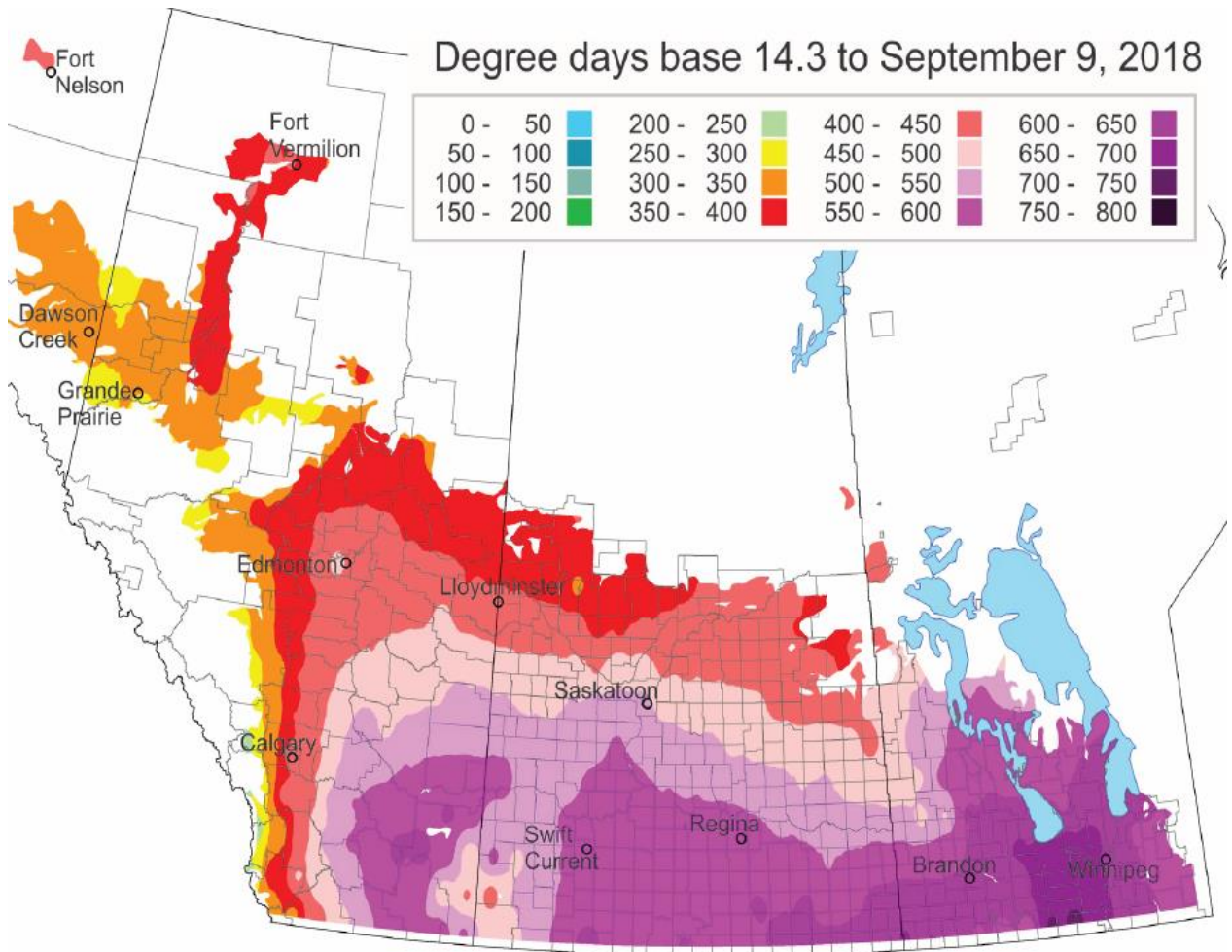
\* Top three communities with the highest weekly average of *Culex tarsalis* are indicated in bold.



**Figure 2** – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during Week 37.



**Figure 3** – Distribution of WNV positive *Culex tarsalis* mosquito pools collected in southern Manitoba (current to Week 37).



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

**Figure 4 - Degree day accumulations, as of Week 37, 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 36).**

Health Region	CDC Week									Totals
	28	29	30	31	32	33	34	35	36	
Interlake-Eastern	0	0	0	0	0	3	3	1	2	9
Prairie Mountain	0	0	1	0	0	1	2	1	0	5
Southern	1	0	0	0	0	0	3	0	2	6
Winnipeg	0	0	0	0	0	0	6	1	1	8
<b>Totals</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>14</b>	<b>3</b>	<b>5</b>	<b>28</b>

\* 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 2018 season by health region (current to Week 37)**

Health Region	CDC Week									Totals
	29	30	31	32	33	34	35	36	37	
Interlake-Eastern	41	30	19	20	14	10	4	1	0	229
Prairie Mountain	78	62	43	56	73	38	14	9	10	566
Southern	73	88	45	57	39	35	11	6	2	641
Winnipeg	48	67	62	39	37	29	10	14	3	488
<b>Weekly Totals</b>	<b>240</b>	<b>247</b>	<b>169</b>	<b>172</b>	<b>163</b>	<b>112</b>	<b>39</b>	<b>30</b>	<b>15</b>	<b>1924</b>

**Table 5\* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to Week 37)**

Health Region	CDC Week									Totals
	29	30	31	32	33	34	35	36	37	
Interlake-Eastern	6 (14.6)	7 (23.3)	2 (10.5)	0 (0)	2 (14.3)	1 (10.0)	0 (0.0)	0 (0)	0 (0)	21 (9.2)
Prairie Mountain	5 (6.4)	10 (16.1)	6 (14.0)	8 (14.3)	13 (17.8)	3 (7.9)	1 (7.1)	1 (11.1)	0 (0)	49 (8.7)
Southern	8 (11.0)	13 (14.8)	4 (8.9)	13 (22.8)	2 (5.1)	5 (14.3)	0 (0.0)	0 (0)	0 (0)	50 (7.8)
Winnipeg	6 (12.5)	11 (16.4)	9 (14.5)	6 (15.4)	6 (16.2)	5 (17.2)	0 (0.0)	0 (0)	0 (0)	48 (9.8)
<b>Weekly Totals</b>	<b>25 (10.4)</b>	<b>41 (16.6)</b>	<b>21 (12.4)</b>	<b>27 (15.7)</b>	<b>23 (14.1)</b>	<b>14 (12.5)</b>	<b>1 (2.6)</b>	<b>1 (3.3)</b>	<b>0 (0)</b>	<b>168 (8.7)</b>

\* 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 36)**

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
<b>2018</b>	<b>168</b>	<b>28</b>	<b>TBD</b>	<b>TBD</b>
2017	41	5	41	5
2016	39	23	39	24
2015	30	5	30	5
2014	24	4	24	5
2013	19	3	19	3
2012	116	39	116	39
2011	0	0	0	0
2010	20	0	20	0
2009	2	2	2	2
2008	41	12	41	12
2007	948	571	948	587
2006	171	49	171	51
2005	193	52	193	58
2004	57	3	57	3
2003	288	137	290	143

## **WNV Activity in Canada and the United States**

### **Canada:**

- As of Week 36 there have been:
  - 154 WNV human cases (5 in Alberta, 28 in Manitoba, 54 in Ontario (including 2 travel-related cases), 43 in Quebec and 24 in Saskatchewan) including 3 WNV associated fatalities.
  - 538 WNV positive mosquito pools (168 in Manitoba, 283 in Ontario, 36 in Quebec and 51 in Saskatchewan),
  - 73 WNV positive birds (14 in Manitoba, 25 in Ontario, 31 in Quebec and 3 in Saskatchewan), and
  - 57 WNV positive horses (27 in Alberta, 7 in Manitoba, 1 in Ontario, 1 in Quebec and 21 in Saskatchewan) reported in Canada.
  
- Additional Canadian WNV information can be obtained by consulting the Public Health Agency of Canada West Nile virus website at <https://www.canada.ca/en/public-health/services/diseases/west-nile->

[virus/surveillance-west-nile-virus.html](#), or by consulting the respective provincial department websites.

***United States:***

- As of September 4, 2018 the US CDC is reporting WNV activity from 45 states (includes human cases, positive mosquito pools and positive birds). A total of 559 human cases along with 136 presumptive blood donors have been reported to date, of which 56% have been classified as West Nile neuroinvasive disease. The US CDC is also reporting eighteen (18) WNV related deaths this year.
- WNV activity has been reported from:
  - Minnesota (20 human cases (including 16 presumptive viremic blood donors) and numerous positive mosquito pools),
  - North Dakota (108 human cases (including 25 viremic blood donors), 88 WNV positive mosquito pools, 4 WNV positive horse and 12 WNV positive birds), and
  - South Dakota (124 human cases (including 2 WNV associated mortality and 19 presumptive viremic blood donors) and numerous mosquito pools).
- Up to date U.S. WNV information can be obtained by visiting the United States Centers for Disease Control and Prevention – West Nile virus Website' at <https://www.cdc.gov/westnile/statsmaps/preliminarymapsdata2018/index.html>, or by consulting state specific Public Health websites.

## Appendix 1

**Table 8 – 2018 CDC surveillance weeks**

CDC Week Number	Dates	CDC Week Number	Dates
21	May 20 – May 26	30	July 22 - July 28
22	May 27 – June 2	31	July 29 - August 4
23	June 3 - June 9	32	August 5 - August 11
24	June 10 - June 16	33	August 12 - August 18
25	June 17 - June 23	34	August 19 - August 25
26	June 24 – June 30	35	August 26 - September 1
27	July 1 - July 7	36	September 2 - September 8
28	July 8 - July 14	37	September 9 - September 15
29	July 15 - July 21	38	September 16 - September 22

## 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.