

## **MANITOBA HEALTH, HEALTHY LIVING & SENIORS**

### **WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 33)**

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, Healthy Living & Seniors (MHLS) 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 MHLS.
  - Human cases are included in the Weekly WNV Surveillance Report based on the date they are reported to MHLS. Case classification information is not included in this report.
- **Horse**: Surveillance of WNV in horses is conducted by Manitoba Agriculture Food and Rural Development (MAFRD) with cases reported to MHLS 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 MHLS 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.

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

## - WNV Provincial Surveillance Data -

- During Week 33\* (August 10 – August 16) Manitoba Health, Healthy Living & Seniors detected six (6) additional WNV positive mosquito pools (Figure 1). The positive pools were collected from six separate communities within the Interlake-Eastern, Southern and Winnipeg Health Regions.
  - To date (as of Week 33) a total of 14 WNV positive mosquito pools have been detected from seven sentinel communities.
  - As of Week 33 there have been no human or horse WNV cases reported in the province.
- *Culex tarsalis* mosquitoes were collected in all twenty-nine (29) sentinel communities. In comparison to the previous week, the average *Culex tarsalis* numbers increased significantly across the province during Week 33 with the largest increase seen within communities in the Interlake-Eastern Health region (Table 1 & 2; Figure 2).

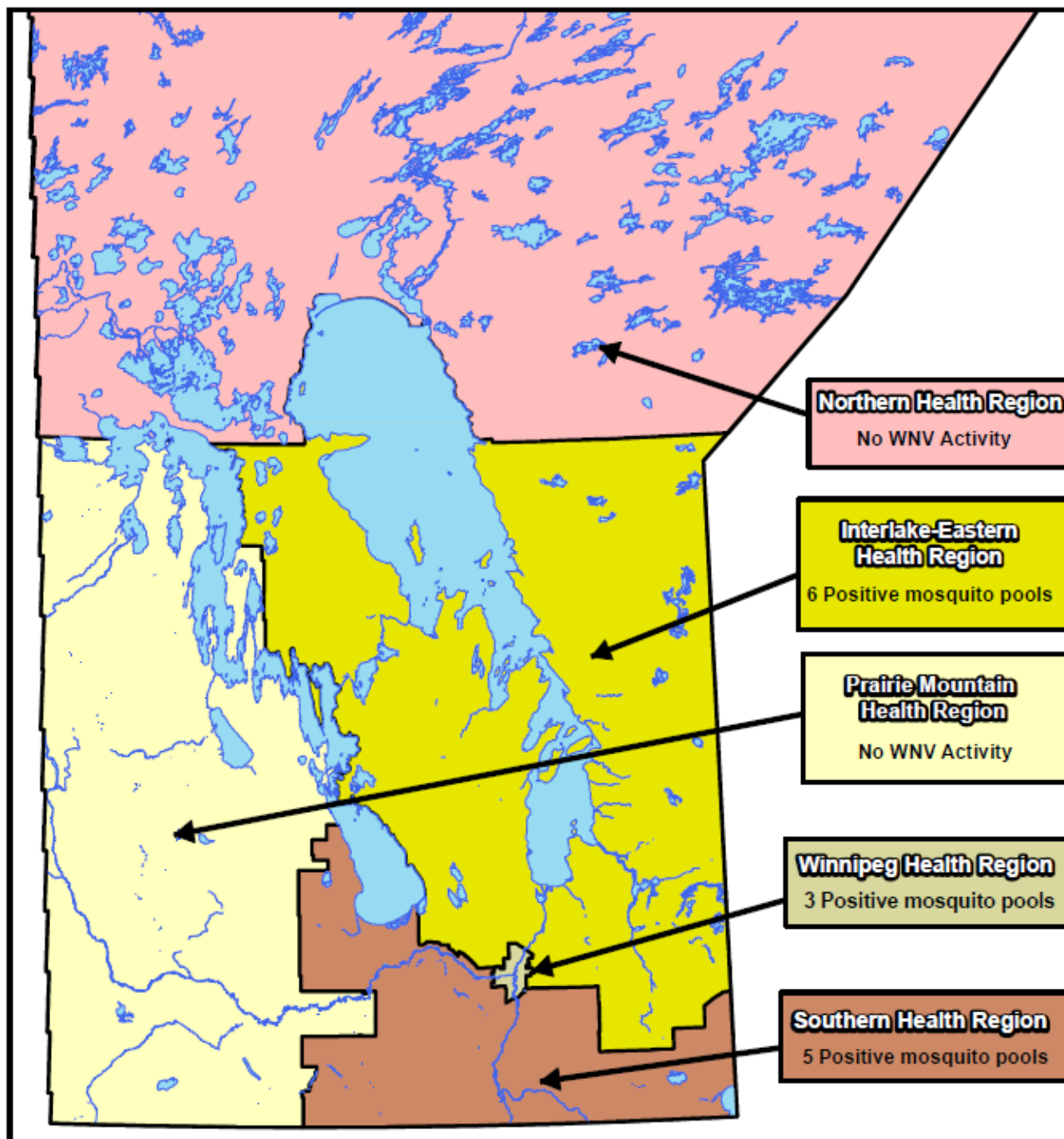
\* For a listing of CDC surveillance weeks and corresponding dates for the 2014 please see Appendix 1.

**2013 Year-End WNV Surveillance Data\***

- With the detection of WNV activity in Manitoba in Week 30 the 2013 Year-End WNV Surveillance summary will no longer be included in the current, or future, weekly surveillance reports. The 2013 Year-End Surveillance summary can be found in earlier 2014 weekly surveillance reports.

**Table 1** – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to Week 33)

Health Region	CDC Week								
	25	26	27	28	29	30	31	32	33
Interlake-Eastern	0.05	11.78	6.15	153.89	54.79	149.06	14.56	27.00	268.84
Prairie Mountain	0.05	1.05	0.41	2.40	3.97	24.51	11.10	27.74	34.72
Southern	1.61	2.19	11.63	91.05	21.95	49.20	56.79	152.93	175.67
Winnipeg	0.24	7.03	16.53	73.77	20.50	53.53	19.51	26.59	336.35
Provincial Average	0.57	4.40	8.87	71.08	21.59	57.33	28.17	66.58	185.24
	Indicates that one or more positive mosquito pools were detected within the health region.								



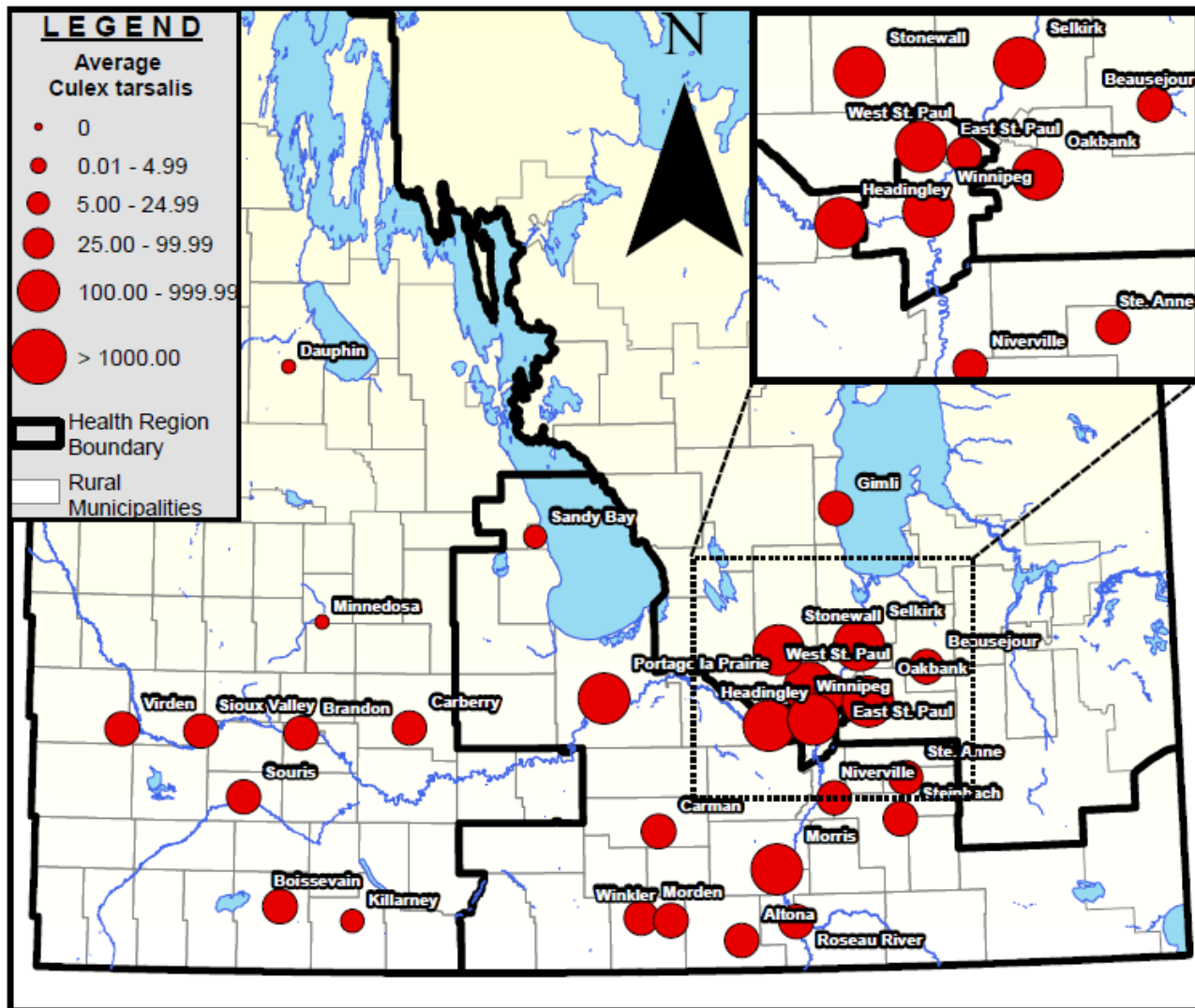
**Figure 1** – WNV activity by Health Region within Manitoba (current to Week 33).

**Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community in southern Manitoba – three week trend (current to Week 33).**

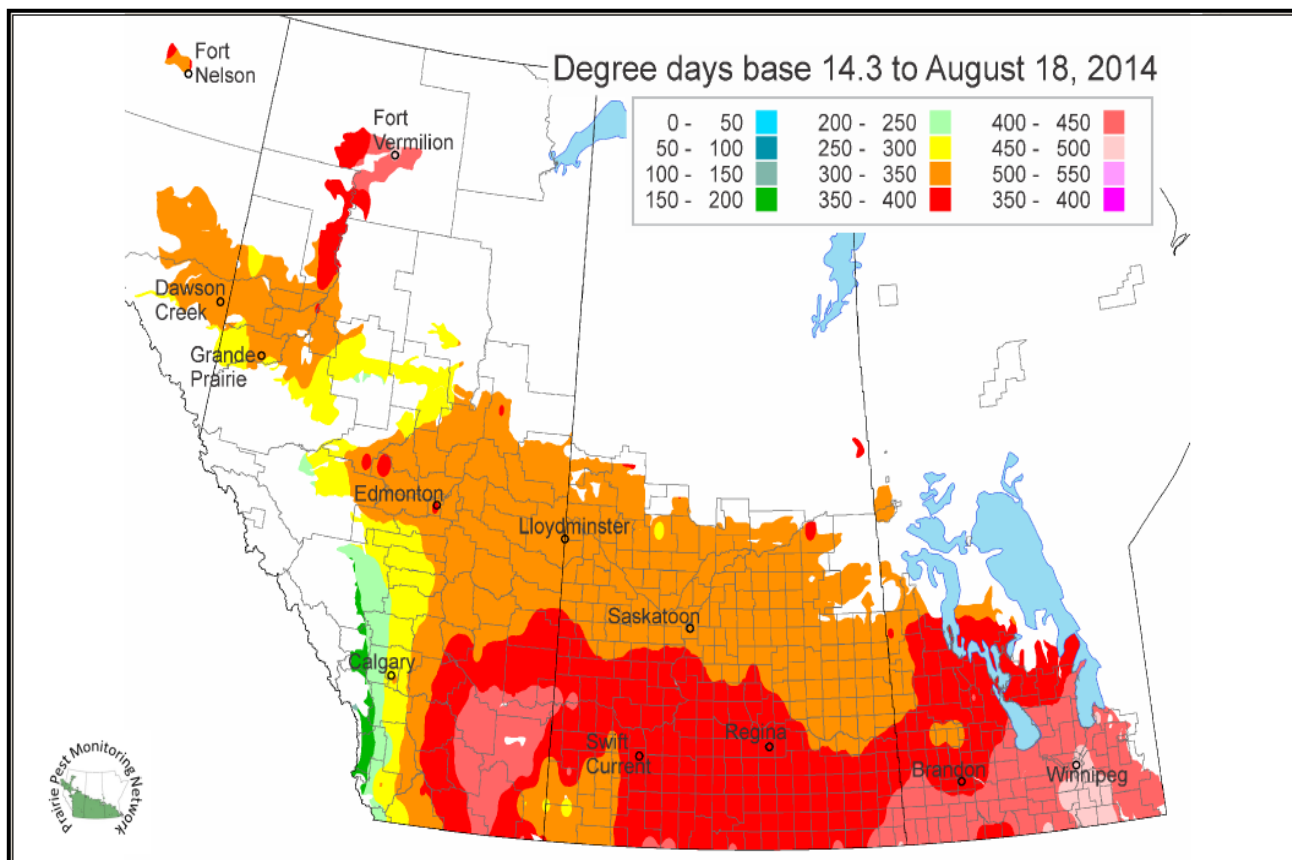
Health Region	Community	Week 33	Week 32	Week 31
Interlake-Eastern	Beausejour	91.00	30.67	12.67
	Gimli	95.00	22.00	6.25
	Oakbank	284.25	33.25	27.50
	Selkirk	168.25	31.75	7.00
	<b>Stonewall</b>	<b>662.25</b>	18.25	17.00
Prairie Mountain	Boissevain	74.75	46.00	24.25
	Brandon	36.00	49.10	9.00
	Carberry	33.50	24.50	12.50
	Dauphin	1.50	0.00	1.25
	Killarney	14.67	12.25	15.00
	Minnedosa	1.25	0.00	0.75
	Sioux Valley FN	37.00	19.50	7.00
	Souris	44.25	43.25	20.00
	Virden	63.75	16.00	11.25
Southern	Altona	50.25	49.25	42.00
	Carman	86.50	<b>258.00</b>	38.00
	Headingley	274.00	141.00	22.00
	Morden	91.75	<b>230.50</b>	30.25
	Morris	238.00	36.25	64.00
	Niverville	92.50	24.00	46.25
	<b>Portage la Prairie</b>	<b>998.50</b>	<b>948.00</b>	<b>260.50</b>
	Roseau River FN	43.00	4.50	27.33
	Ste. Anne	37.50	6.75	14.25
	Sandy Bay FN	19.75	14.25	7.25
	Steinbach	32.75	20.75	9.00
	Winkler	84.75	74.25	<b>87.50</b>
	Winnipeg	East St Paul	65.00	11.00
<b>West St Paul</b>		<b>854.00</b>	69.00	<b>85.50</b>
Winnipeg		337.25	24.80	16.42
	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 33.



Source: Map produced courtesy of Agriculture and Agri-Food Canada.

**Figure 3** - Degree day accumulations, as of Week 33, across the Prairie Provinces.

**Table 3** – Total number of human WNV cases\*, by Health Region of residence, reported to Manitoba Health, Healthy Living & Seniors by laboratories (current to Week 33)

Health Region	CDC Week												Totals
	22	23	24	25	26	27	28	29	30	31	32	33	
Interlake-Eastern	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
Southern	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
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\* Note that cases are presented by week reported to MHHLS, 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 2014 season by health region (current to Week 33)

Health Region	CDC Week											Totals
	23	24	25	26	27	28	29	30	31	32	33	
Interlake-Eastern	6	0	1	6	16	25	27	27	18	22	62	211
Prairie Mountain	0	0	2	13	7	16	29	34	35	39	45	220
Southern	13	0	16	24	28	55	40	46	56	66	84	432
Winnipeg	14	0	4	19	25	32	25	35	32	37	84	310
<b>Weekly Totals</b>	<b>33</b>	<b>0</b>	<b>23</b>	<b>62</b>	<b>76</b>	<b>128</b>	<b>121</b>	<b>142</b>	<b>141</b>	<b>164</b>	<b>275</b>	<b>1173</b>

**Table 5\*** – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to Week 33)

Health Region	CDC Week											Totals
	23	24	25	26	27	28	29	30	31	32	33	
Interlake-Eastern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (7.4)	2 (11.1)	0 (0)	2 (3.2)	6 (2.8)
Prairie Mountain	0 (0)	0 (0)	0 (0)	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)	2 (3.6)	1 (1.5)	2 (2.4)	5 (1.2)
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3.1)	0 (0)	2 (2.4)	3 (1.0)
<b>Weekly Totals</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>2 (1.4)</b>	<b>5 (3.5)</b>	<b>1 (0.6)</b>	<b>6 (2.2)</b>	<b>14 (1.2)</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 33)**

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
<b>2014</b>	<b>14</b>	<b>0</b>	<b>TBD</b>	<b>TBD</b>
<b>2013</b>	16	3	19	3
<b>2012</b>	108	33	116	39
<b>2011</b>	0	0	0	0
<b>2010</b>	19	0	20	0
<b>2009</b>	2	2	2	2
<b>2008</b>	31	10	41	12
<b>2007</b>	894	431	948	587
<b>2006</b>	161	41	171	51
<b>2005</b>	187	40	193	58
<b>2004</b>	54	3	57	3
<b>2003</b>	149	66	290	143

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

#### *Canada:*

- As of Week 33 one (1) human WNV case (Ontario), thirty-eight (38) WNV positive mosquito pools (14 in Manitoba, 11 in Ontario, 10 in Quebec and 3 in Saskatchewan), two (2) WNV positive birds (Saskatchewan) and two (2) WNV positive horses (1 in Alberta and 1 in Saskatchewan) have been detected in Canada (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://www.phac-aspc.gc.ca/wnv-vwn/index-eng.php>

#### *United States:*

- As of Week 33 a total of two-hundred and eleven (211) human WNV cases, including eleven (11) deaths, have been reported in the United States. In addition 5,356 WNV positive mosquito pools, 1,362 WNV positive birds and eleven (11) WNV positive horses have been identified across the United States.
  - As of Week 33 Minnesota is reporting ten (10) WNV positive mosquito pools, one (1) WNV positive horse and two (2) WNV positive birds (Table 7).



- As of Week 33 North Dakota is reporting four (4) WNV human cases, six (6) WNV positive mosquito pools and two (2) WNV positive horses.
  - As of Week 33 South Dakota is reporting twenty-one (21) WNV human cases and forty-seven (47) 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/index.html>

**Table 7** – Positive human, mosquito, horse and bird West Nile Virus surveillance indicators across Canada and neighbouring US states as of Week 33.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds
<b>Manitoba</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>0</b>
Saskatchewan	0	3	1	2
Alberta	0	N/A**	1	N/A
North Dakota	4	6	2	0
South Dakota	21	57	1	1
Minnesota	0	10	1	2
Ontario	1	11	0	0
British Columbia	0	0	0	0
Quebec	0	10	0	0
Maritimes	0	N/A	0	N/A
<b>TOTAL</b>	<b>26</b>	<b>111</b>	<b>6</b>	<b>5</b>

\* 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 – 2014 CDC surveillance weeks**

CDC Week Number	Dates	CDC Week Number	Dates
<b>21</b>	May 18 - May 24	<b>30</b>	July 20 - July 26
<b>22</b>	May 25 – May 31	<b>31</b>	July 27 - August 2
<b>23</b>	June 1 - June 7	<b>32</b>	August 3 - August 9
<b>24</b>	June 8 - June 14	<b>33</b>	August 10 - August 16
<b>25</b>	June 15 - June 21	<b>34</b>	August 17 - August 23
<b>26</b>	June 22 - June 28	<b>35</b>	August 24 - August 30
<b>27</b>	June 29 - July 5	<b>36</b>	August 31 - September 6
<b>28</b>	July 6 - July 12	<b>37</b>	September 7 - September 13
<b>29</b>	July 13 - July 19	<b>38</b>	September 14 - September 20

## - 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.