

MANITOBA HEALTH, HEALTHY LIVING & SENIORS

WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 31)

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, 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) 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 31* (July 27 – August 2) Manitoba Health, Healthy Living & Seniors detected five (5) WNV positive mosquito pools (Figure 1). The samples were collected from five separate sentinel communities distributed across the Interlake-Eastern, Southern and Winnipeg Health Regions.
 - To date (as of Week 31) a total of 7 WNV positive mosquito pools have been detected from six sentinel communities.
 - As of Week 31 there have been no human or horse WNV cases reported in the province.
- For the first time during the 2014 season *Culex tarsalis* mosquitoes were collected from all twenty-nine (29) sentinel communities spread across all four southern Manitoba Health regions; Interlake-Eastern, Prairie Mountain, Southern and Winnipeg in Week 31 (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 31)

Health Region	CDC Week									
	22	23	24	25	26	27	28	29	30	31
Interlake-Eastern	0.06	0.83	0.00	0.05	11.78	6.15	153.89	54.79	149.06	14.56
Prairie Mountain	0.00	0.00	0.00	0.05	1.05	0.41	2.40	3.97	24.51	11.10
Southern	0.10	0.60	0.00	1.61	2.19	11.63	91.05	21.95	49.20	56.79
Winnipeg	0.09	1.47	0.00	0.24	7.03	16.53	73.77	20.50	53.53	19.51
Provincial Average	0.07	0.68	0.00	0.57	4.40	8.87	71.08	21.59	57.33	28.17
	Indicates that one or more positive mosquito pools were detected within the health region.									

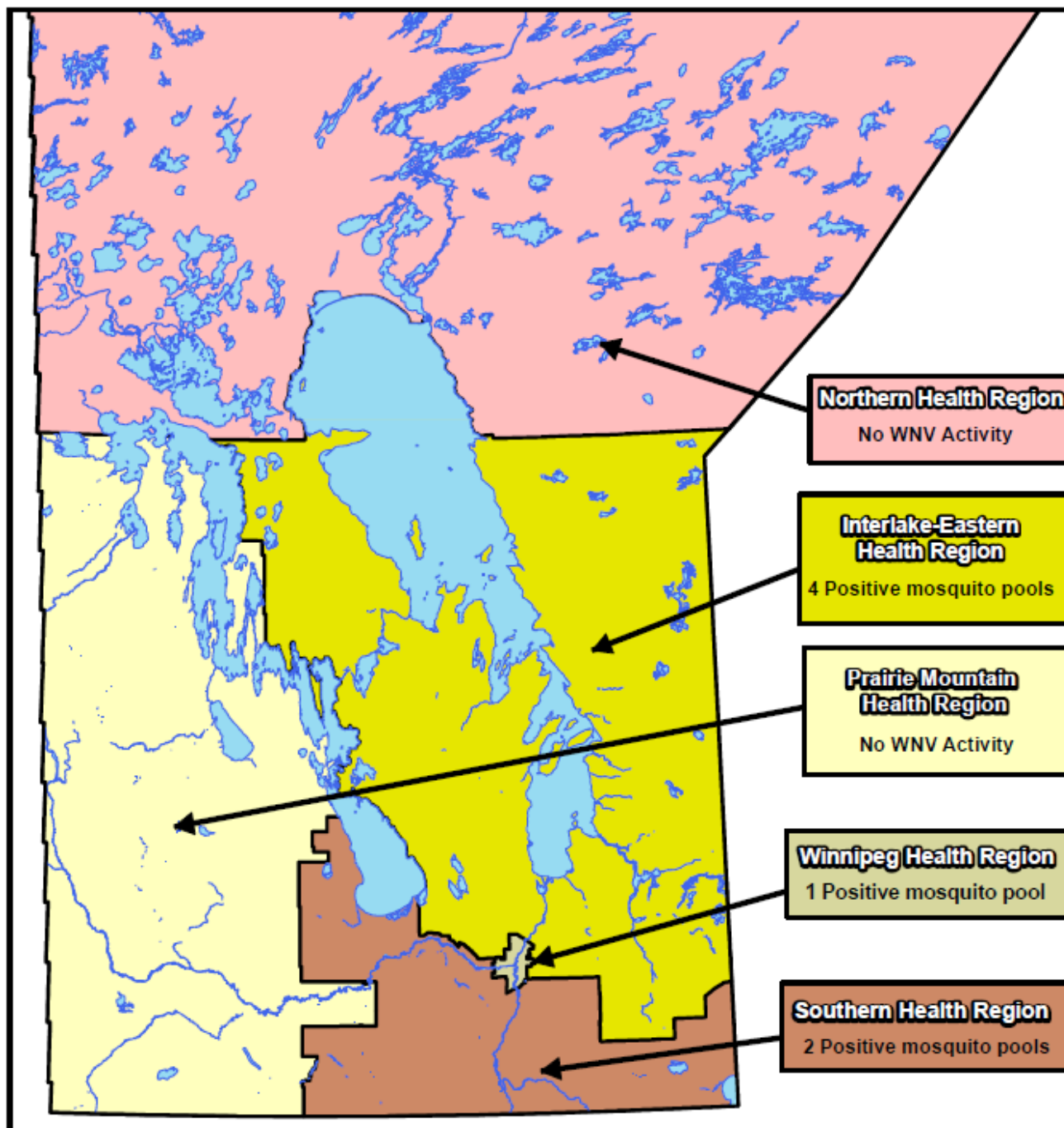


Figure 1 – WNV activity by Health Region within Manitoba (current to Week 31).

Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community in southern Manitoba – three week trend (current to Week 31).

Health Region	Community	Week 31	Week 30	Week 29
Interlake-Eastern	Beausejour	12.67	54.50	14.00
	Gimli	6.25	83.33	50.00
	Oakbank	27.50	433.25	121.00
	Selkirk	7.00	84.00	23.75
	Stonewall	17.00	57.50	68.67
Prairie Mountain	Boissevain	24.25	44.75	8.75
	Brandon	9.00	24.50	3.22
	Carberry	12.50	56.00	5.50
	Dauphin	1.25	0.00	0.00
	Killarney	15.00	23.00	5.75
	Minnedosa	0.75	0.75	1.50
	Sioux Valley FN	7.00	No Trapping	No Trapping
	Souris	20.00	30.50	3.75
	Virden	11.25	24.50	4.50
Southern	Altona	42.00	31.75	13.75
	Carman	38.00	32.50	11.00
	Headingley	22.00	44.00	15.50
	Morden	30.25	33.50	14.00
	Morris	64.00	58.50	17.00
	Niverville	46.25	121.00	76.00
	Portage la Prairie	260.50	150.00	54.00
	Roseau River FN	27.33	32.00	29.25
	Ste. Anne	14.25	59.75	12.75
	Sandy Bay FN	7.25	4.00	1.67
	Steinbach	9.00	1.25	21.00
	Winkler	87.50	15.25	9.75
	Winnipeg	East St Paul	1.50	36.00
West St Paul		85.50	248.00	2.00
Winnipeg		16.42	42.47	21.22
	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.

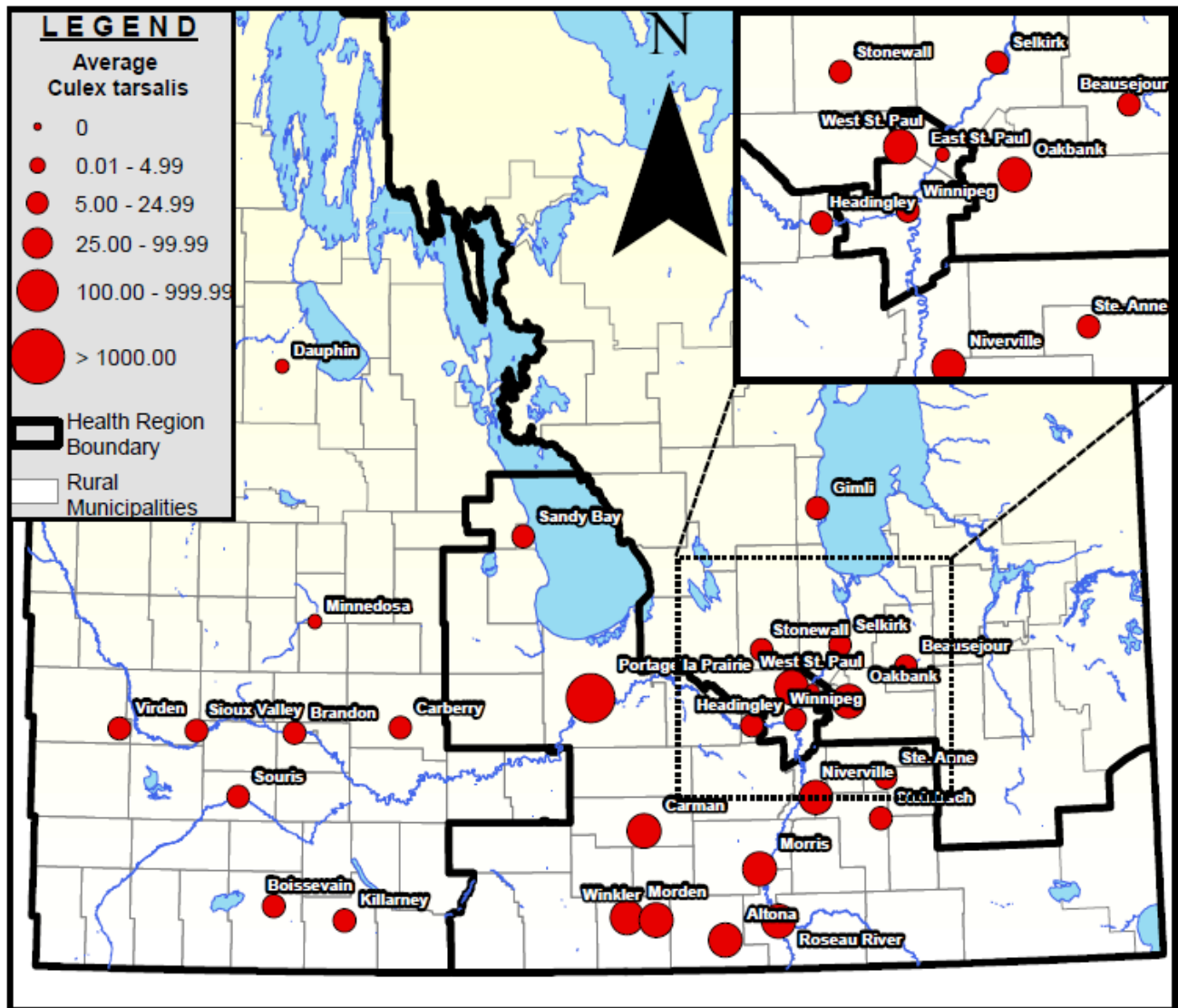
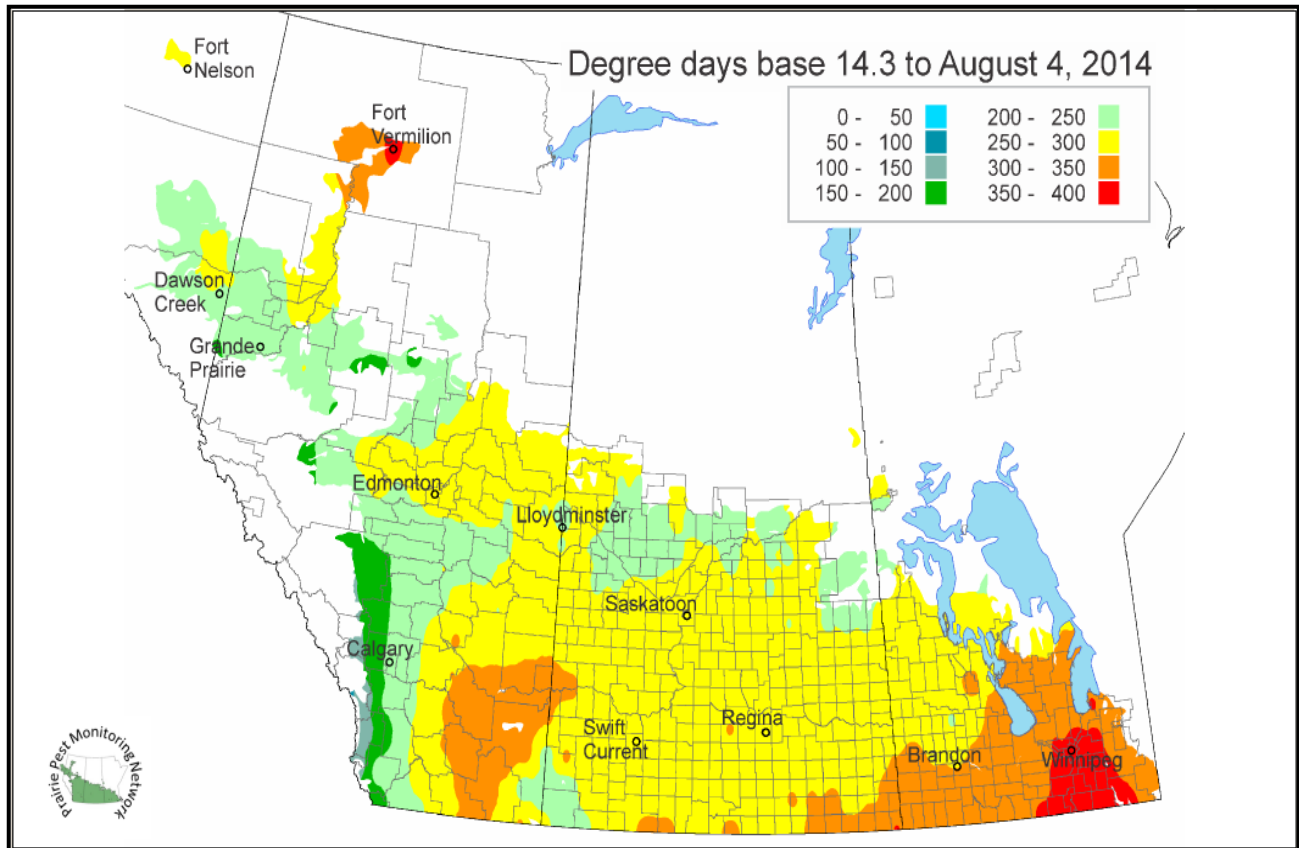


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during Week 31.



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

Figure 3 - Degree day accumulations, as of Week 31, 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 31)

Health Region	CDC Week												Totals
	21	22	23	24	25	26	27	28	29	30	31	32	
Interlake-Eastern	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
Southern	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
Totals	0	0	0	0	0	0	0	0	0	0	0		0

* Note that cases are presented by week reported to MHLS, 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 31)

Health Region	CDC Week												Totals
	21	22	23	24	25	26	27	28	29	30	31	32	
Interlake-Eastern	0	1	6	0	1	6	16	25	27	27	18		127
Prairie Mountain	0	0	0	0	2	13	7	16	29	34	35		136
Southern	0	4	13	0	16	24	28	55	40	46	56		282
Winnipeg	0	3	14	0	4	19	25	32	25	35	32		189
Weekly Totals	0	8	33	0	23	62	76	128	121	142	141		734

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to Week 31)

Health Region	CDC Week												Totals
	22	23	24	25	26	27	28	29	30	31	32		
Interlake-Eastern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (7.4)	2 (11.1)		4 (3.1)
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)	0 (0)	0 (0)	2 (3.6)		2 (0.7)
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3.1)		1 (0.5)
Weekly Totals	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (1.4)	5 (3.5)		7 (1.0)

* 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 31)

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
2014	7	0	TBD	TBD
2013	10	1	19	3
2012	48	20	116	39
2011	0	0	0	0
2010	4	0	20	0
2009	0	0	2	2
2008	7	4	41	12
2007	322	77	948	587
2006	78	20	171	51
2005	50	14	193	58
2004	16	3	57	3
2003	35	6	290	143

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

Canada:

- As of Week 31 one (1) human WNV case (Ontario) and sixteen (16) WNV positive mosquito pools (7 in Manitoba, 5 in Ontario and 4 in Quebec) 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 31 a total of eighty-two (82) human WNV cases, including four (4) deaths, have been reported in the United States. In addition 3,238 WNV positive mosquito pools, 941 WNV positive birds and two (2) WNV positive horses have been identified across the United States.
 - As of Week 31 Minnesota is reporting six (6) WNV positive mosquito pools and one (1) WNV positive bird (Table 7).
 - As of Week 31 North Dakota is reporting one (1) WNV human case, four (4) WNV positive mosquito pools and one (1) WNV positive horse.

- As of Week 31 South Dakota is reporting twelve (12) human WNV cases and twenty-one (21) 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 31.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds
Manitoba	0	7	0	0
Saskatchewan	0	0	0	0
Alberta	0	N/A**	0	N/A
North Dakota	1	4	1	0
South Dakota	12	21	0	0
Minnesota	0	6	0	1
Ontario	1	5	0	0
British Columbia	0	0	0	0
Quebec	0	4	0	0
Maritimes	0	N/A	0	N/A
TOTAL	14	47	1	1

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