

MANITOBA HEALTH

WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 35)

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 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 Manitoba Health.
 - Human cases are included in the Weekly WNV Surveillance Report based on the date they are reported to Manitoba Health. Case classification information is not included in this report.
- **Horse**: Surveillance of WNV in horses is conducted by Manitoba Agriculture Food and Rural Initiatives (MAFRI) with cases reported to Manitoba Health 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 Manitoba Health 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 of mosquito pool & degree days consult Appendix 2.*

- WNV Provincial Surveillance Data -

- During Week 35* (August 25 – 31) Manitoba Health detected two (2) additional WNV positive mosquito pools, from two separate health regions. In addition the first WNV positive horse case was identified, from a farm in the Southern Health Region. There were no WNV positive human or bird cases detected (Figure 1).
 - To date (as of week 35) one human WNV case, nineteen (19) WNV positive mosquito pools (collected from nine communities), one WNV positive bird** and one WNV positive horse have been identified in Manitoba.
- *Culex tarsalis* mosquitoes were collected from twenty-six surveillance communities across all four southern Manitoba Health Regions in Week 35 (Table 1 & 2; Figure 2). The numbers of *Culex tarsalis* collected during week 35 decreased in most communities compared to week 34. The highest numbers in week 35 were observed in a handful of communities from both the Southern and Prairie Mountain Health Regions.

* For a listing of CDC surveillance weeks and corresponding dates for 2013 please see Appendix 1.

** The West Nile virus dead corvid pick up program is not in effect in 2013. Dead corvids are no longer needed as an early indicator of WNV in Manitoba or to determine geographic distribution. Larval & adult mosquito sampling and testing, in addition to other factors (e.g. temperature) are used to guide the assessment of the risk of WNV exposure. The positive bird was submitted for testing to the Canadian Cooperative Wildlife Health Centre, in Saskatoon.

2012 Year-End WNV Surveillance Data*

* With the detection of WNV activity in Manitoba in week 28 the 2012 Year-End WNV Surveillance summary will no longer be included in the current & future 2013 weekly surveillance reports. The 2012 Year-End WNV Surveillance summary can be found in earlier 2013 surveillance reports.

Table 1 – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to week 35)

Health Region	CDC Week											
	25	26	27	28	29	30	31	32	33	34	35	36
Interlake-Eastern	0.05	0.15	0.50	3.70	17.80	20.70	4.70	3.00	0.50	3.40	3.70	
Prairie Mountain	0.03	0.73	0.97	9.40	9.00	16.20	2.40	5.40	3.50	34.30	14.70	
Southern	0.18	3.24	7.65	17.70	70.80	67.20	20.20	22.80	6.50	22.60	9.30	
Winnipeg	0.15	0.35	0.81	15.10	31.10	26.30	6.10	3.60	0.60	15.40	8.70	
Provincial Average	0.11	1.38	3.10	12.70	36.40	36.10	9.20	10.20	3.30	21.30	10.00	
	Indicates that one or more positive mosquito pools were detected within the health region.											

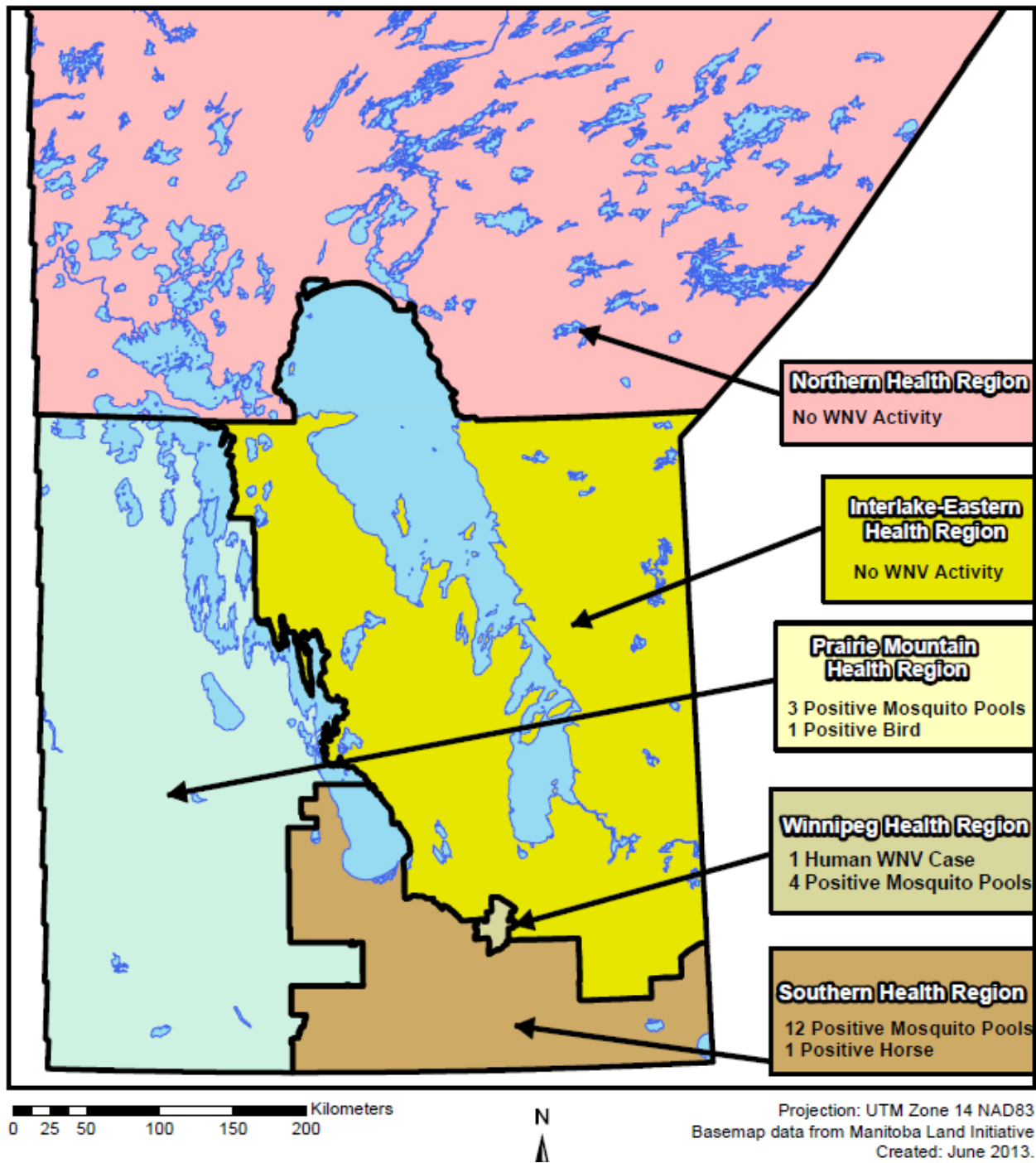


Figure 1 – WNV activity by Health Region within Manitoba (current to week 35).

Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community* in southern Manitoba – three week trend (current to week 35).

Health Region	Community	Week 35	Week 34	Week 33
Interlake-Eastern	Beausejour	7.50	2.30	0.80
	Gimli	0.00	1.80	0.00
	Oakbank	1.00	3.00	0.00
	Selkirk	4.80	4.00	1.30
	Stonewall	4.00	6.00	0.30
Prairie Mountain	Boissevain	113.70	120.00	15.30
	Brandon	5.30	15.80	1.40
	Carberry	6.30	22.80	3.00
	Dauphin	0.50	2.50	1.50
	Killarney	17.00	36.30	11.00
	Minnedosa	0.30	0.00	0.00
	Sioux Valley FN	4.50	6.30	3.80
	Souris	3.80	76.30	0.30
	Virden	15.00	85.70	0.30
Southern	Altona	4.00	19.00	1.70
	Carman	2.50	10.50	6.00
	Headingley	0.00	0.00	0.50
	Morden	20.50	76.30	24.70
	Morris	2.70	42.50	2.80
	Niverville	0.50	3.80	1.30
	Portage la Prairie	30.70	38.00	32.30
	Roseau River FN	0.00	0.70	0.00
	Ste. Anne	0.50	1.00	0.30
	Sandy Bay FN	0.00	26.00	0.50
	Steinbach	2.80	3.80	1.00
	Winkler	35.30	42.00	8.50
Winnipeg	East St Paul	1.50	2.00	0.00
	West St Paul	30.50	0.00	0.50
	Winnipeg	7.70	16.30	0.70
	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.

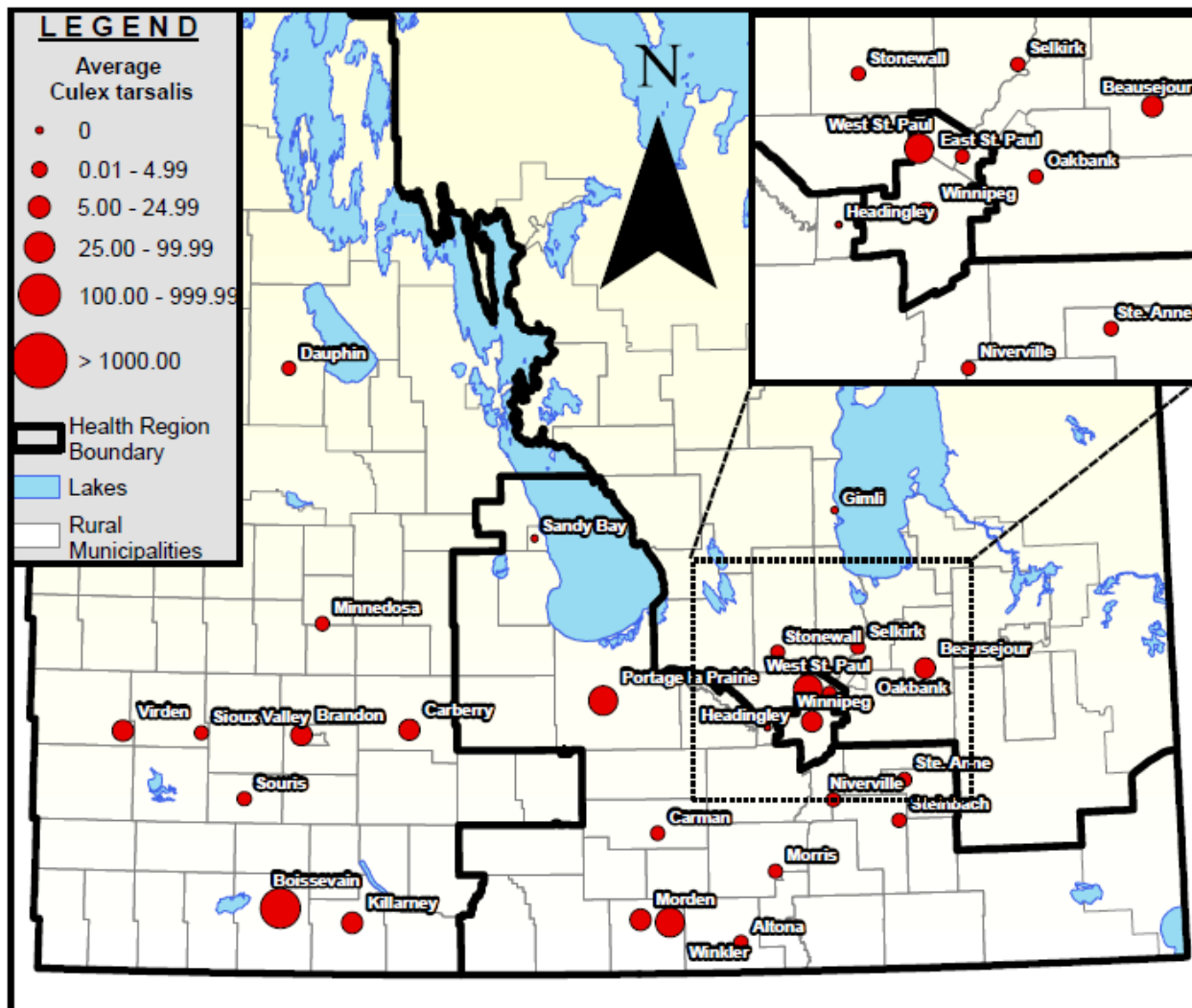
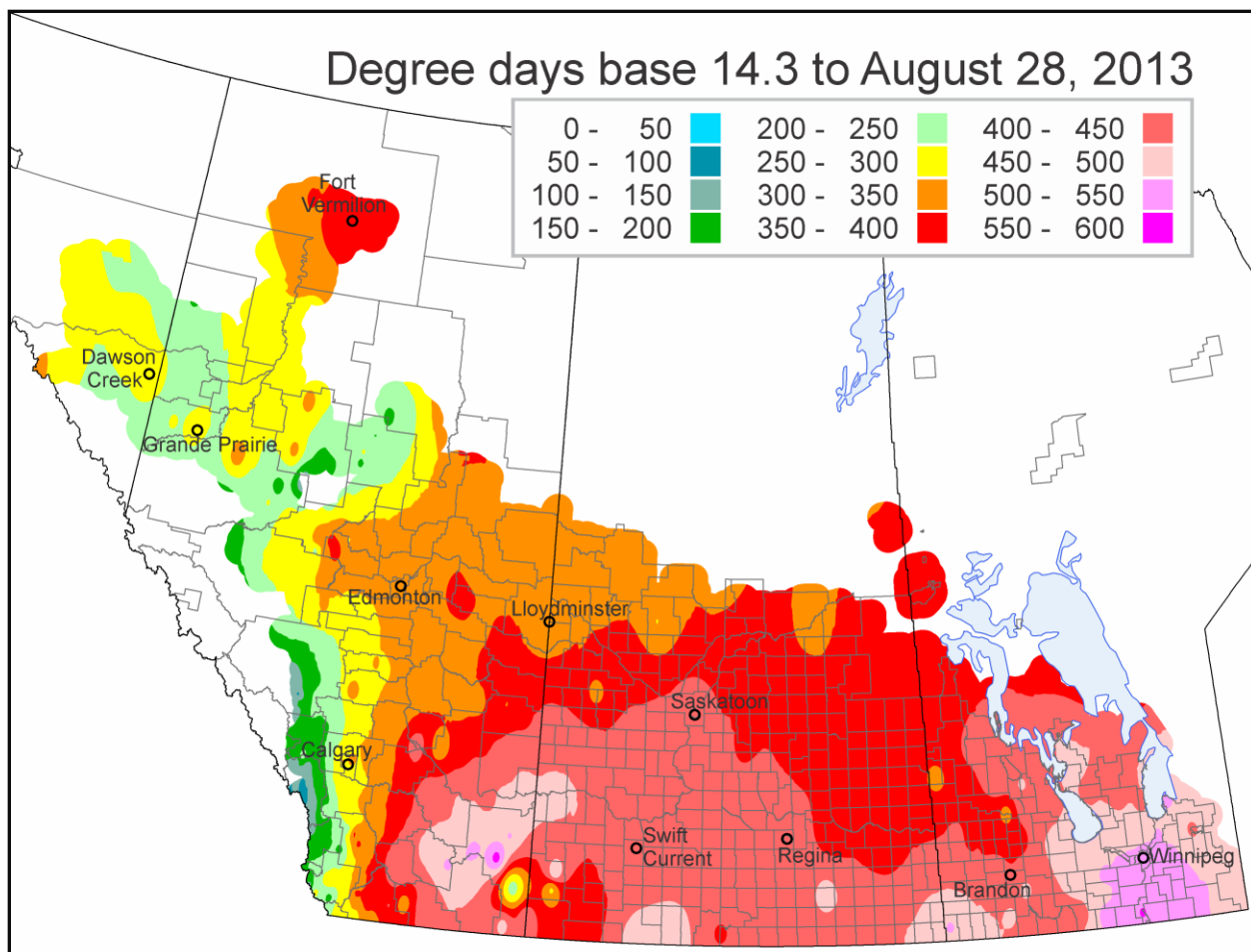


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during week 35.



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

Figure 3 - Degree day accumulations, as of week 35, across the Prairie Provinces.

Table 3 – Total number of human WNV cases*, by Health Region of residence, reported to Manitoba Health by laboratories (current to week 35)

Health Region	CDC Week													Totals
	24	25	26	27	28	29	30	31	32	33	34	35	36	
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	1	0	0		1
Totals	0	0	0	0	0	0	0	0	0	1	0	0		1

* Note that cases are presented by week reported to Manitoba Health, 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 2013 season by Health Region (current to week 35)

RHA	CDC Week													Totals
	24	25	26	27	28	29	30	31	32	33	34	35	36	
Interlake-Eastern	2	1	2	4	13	16	20	16	13	5	12	11		115
Prairie Mountain	5	1	9	15	24	28	32	20	29	21	43	33		260
Southern	6	5	22	24	40	58	74	45	45	29	42	29		419
Winnipeg	4	4	9	9	26	29	40	28	24	12	30	24		239
Weekly Totals	17	11	42	52	103	131	166	109	111	67	127	97	0	1033

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to week 35)

Health Region	CDC Week													Totals	
	24	25	26	27	28	29	30	31	32	33	34	35	36		
Interlake-Eastern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	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)	1 (3.1)	1 (5.0)	0 (0)	0 (0)	0 (0)	1 (3.0)		3 (1.2)	
Southern	0 (0)	0 (0)	0 (0)	0 (0)	1 (2.5)	2 (3.4)	4 (5.4)	2 (4.4)	1 (2.2)	1 (3.4)	0 (0)	1 (3.4)		12 (2.9)	
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5.0)	1 (3.6)	1 (4.2)	0 (0)	0 (0)	0 (0)		4 (1.7)	
Weekly Totals	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.0)	2 (1.5)	7 (4.2)	4 (3.7)	2 (1.8)	1 (1.5)	0 (0)	2 (2.1)		19 (1.8)	

* 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 35)

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
2013	19	1	<i>TBD</i>	<i>TBD</i>
2012	116	39	116	39
2011	0	0	0	0
2010	20	0	20	0
2009	2	2	2	2
2008	40	12	41	12
2007	943	540	948	587
2006	171	47	171	51
2005	192	51	193	58
2004	57	3	57	3
2003	284	132	290	143

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

Canada:

- As of week 35 a total of eighteen (19) human WNV cases (1 in Manitoba, 17 in Ontario and 1 in Quebec), two-hundred and forty-seven (247) WNV positive mosquito pools (1 in British Columbia, 19 in Manitoba, 155 in Ontario, 23 in Quebec and 36 in Saskatchewan), thirty-nine (39) WNV positive birds (1 in Manitoba, 24 in Ontario, 6 in Quebec and 8 in Saskatchewan) and seven (7) WNV positive animals including five horses (2 in Saskatchewan and 1 each in Alberta, Manitoba and Ontario) have been reported 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 35 a total of four-hundred and ninety-seven (421) human WNV cases have been reported in the United States, including twenty (20) deaths.
- As of Week 35 a total of 7,465 WNV positive mosquito pools, 1,087 WNV positive birds and 70 positive horses have been identified across the United States.

- As of Week 35 Minnesota is reporting thirty-seven (37) human WNV cases (including two death), thirty-four (34) WNV positive mosquito pools, one (1) WNV positive bird and one (2) WNV positive horse;
- As of Week 35 North Dakota is reporting thirty (30) human WNV cases (including one death), twenty (20) WNV positive mosquito pools and six (6) WNV positive birds;
- As of Week 35 South Dakota is reporting seventy-one (71) human WNV cases (including one death), 338 WNV positive mosquito pools, eight (8) WNV positive birds and two (2) WNV positive horses (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 35.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds
Manitoba	1	19	1	1
Saskatchewan	0	36	2	8
Alberta	0	N/A**	1	N/A
North Dakota	30	20	0	6
South Dakota	71	338	2	8
Minnesota	37	34	2	1
Ontario	17	155	2	24
British Columbia	0	1	0	0
Quebec	1	36	1	6
Maritimes	0	N/A	0	N/A
TOTAL	157	639	11	54

* 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.

**** The West Nile virus dead corvid pick up program is not in effect in 2013. Dead corvids are no longer needed as an early indicator of WNV in Manitoba or to determine geographic distribution. Larval & adult mosquito sampling and testing, in addition to other factors (e.g. temperature) are used to guide the assessment of the risk of WNV exposure. The positive bird was submitted for testing to the Canadian Cooperative Wildlife Health Centre, in Saskatoon.

- APPENDIX 1 -

Table 8 – CDC surveillance weeks

CDC Week Number	Dates	CDC Week Number	Dates
21	May 19 - May 25	30	July 21 - July 27
22	May 26 - June 1	31	July 28 - August 3
23	June 2 - June 8	32	August 4 - August 10
24	June 9 - June 15	33	August 11 - August 17
25	June 16 - June 22	34	August 18 - August 24
26	June 23 - June 29	35	August 25 - August 31
27	June 30 - July 6	36	September 1 - September 7
28	July 7 - July 13	37	September 8 - September 14
29	July 14 - July 20	38	September 15 - September 21

- 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.