

MANITOBA HEALTH

WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 36)

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 36* (September 1 - 7) Manitoba Health identified a second WNV human case in a resident of the Interlake-Eastern Health Region (Figure 1). This individual developed the more severe West Nile virus neurological syndrome and subsequently died. This is the first WNV related fatality reported in Manitoba since January of 2008, and only the eighth (8) since monitoring began in 2003.
- No additional (mosquito, horse or bird) positive WNV surveillance indicators were reported to Manitoba Health during Week 36.
 - To date (as of Week 36) two human WNV cases (one severe WNV neurological syndrome and one less severe WNV non-neurological syndrome), 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 eighteen surveillance communities across all four southern Manitoba Health Regions in Week 36 (Table 1 & 2; Figure 2). The numbers of *Culex tarsalis* collected during Week 36 decreased significantly in all communities compared to Week 35. The highest numbers in week 36 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.

NOTE: Week 36 marks the last weekend of regular adult mosquito surveillance in Manitoba for the 2013 season. Adult mosquito surveillance will continue in a handful of communities within all four Manitoba Health Regions through Week 37 (September 8 – 14).

Table 1 – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to week 36)

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	0.20
Prairie Mountain	0.03	0.73	0.97	9.40	9.00	16.20	2.40	5.40	3.50	34.30	14.70	2.10
Southern	0.18	3.24	7.65	17.70	70.80	67.20	20.20	22.80	6.50	22.60	9.30	2.10
Winnipeg	0.15	0.35	0.81	15.10	31.10	26.30	6.10	3.60	0.60	15.40	8.70	0.50
Provincial Average	0.11	1.38	3.10	12.70	36.40	36.10	9.20	10.20	3.30	21.30	10.00	1.50
	Indicates that one or more positive mosquito pools were detected within the health region.											

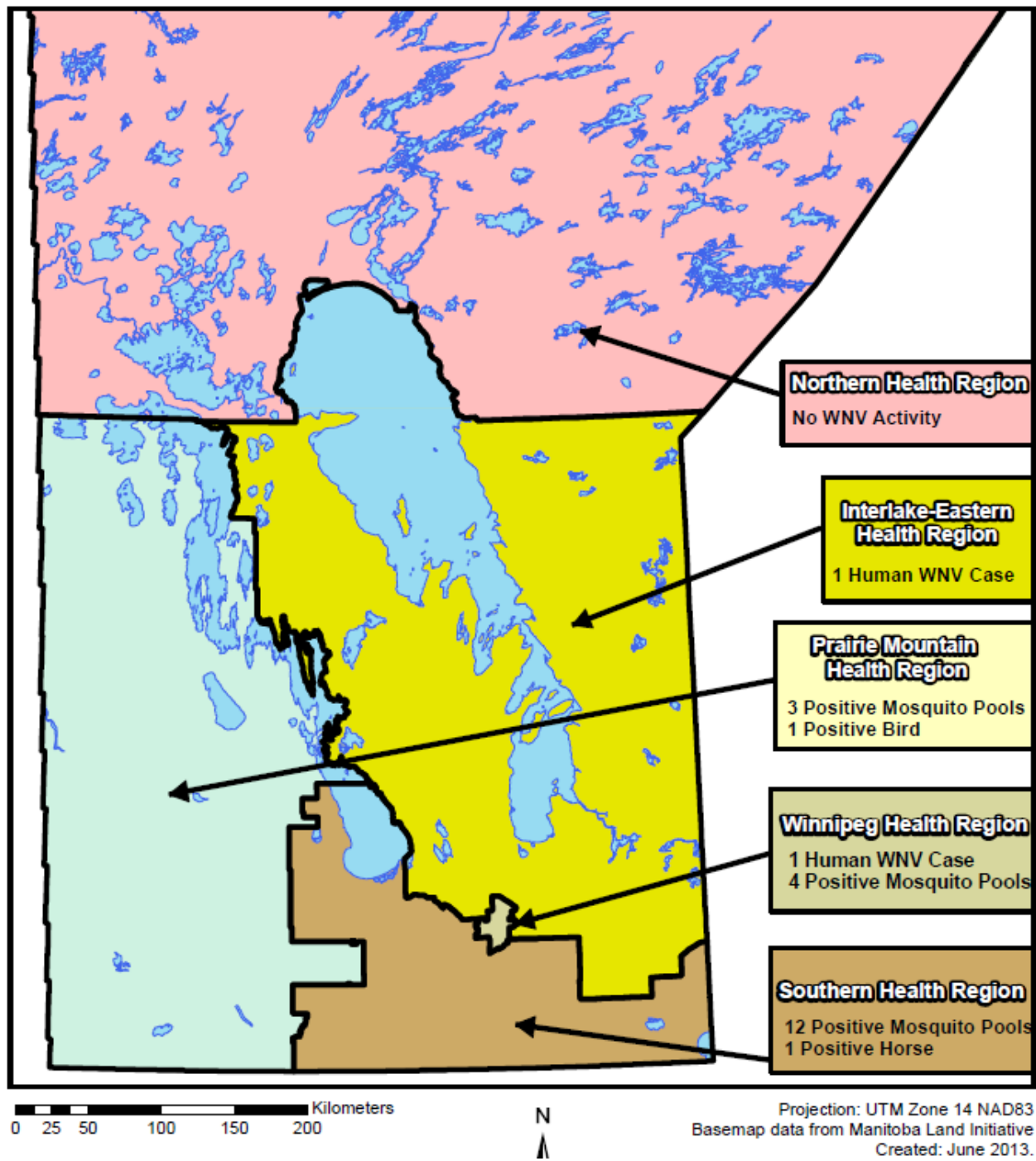


Figure 1 – WNV activity by Health Region within Manitoba (current to week 36).

Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community* in southern Manitoba – three week trend (current to week 36).**

Health Region	Community	Week 36	Week 35	Week 34
Interlake-Eastern	Beausejour	0.00	7.50	2.30
	Gimli	0.00	0.00	1.80
	Oakbank	0.30	1.00	3.00
	Selkirk	0.00	4.80	4.00
	Stonewall	0.80	4.00	6.00
Prairie Mountain	Boissevain	14.30	113.70	120.00
	Brandon	0.10	5.30	15.80
	Carberry	0.00	6.30	22.80
	Dauphin	0.50	0.50	2.50
	Killarney	1.00	17.00	36.30
	Minnedosa	0.00	0.30	0.00
	Sioux Valley FN	1.30	4.50	6.30
	Souris	0.50	3.80	76.30
	Virden	5.00	15.00	85.70
Southern	Altona	0.30	4.00	19.00
	Carman	1.50	2.50	10.50
	Headingley	1.00	0.00	0.00
	Morden	3.80	20.50	76.30
	Morris	0.30	2.70	42.50
	Niverville	0.00	0.50	3.80
	Portage la Prairie	9.00	30.70	38.00
	Roseau River FN	0.00	0.00	0.70
	Ste. Anne	0.00	0.50	1.00
	Sandy Bay FN	0.00	0.00	26.00
	Steinbach	0.00	2.80	3.80
	Winkler	7.30	35.30	42.00
Winnipeg	East St Paul	0.00	1.50	2.00
	West St Paul	1.00	30.50	0.00
	Winnipeg	0.50	7.70	16.30
	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.

** Note that Week 36 will be the last week of regular adult mosquito surveillance for the 2013 season. Adult mosquito surveillance will continue in a handful of communities.

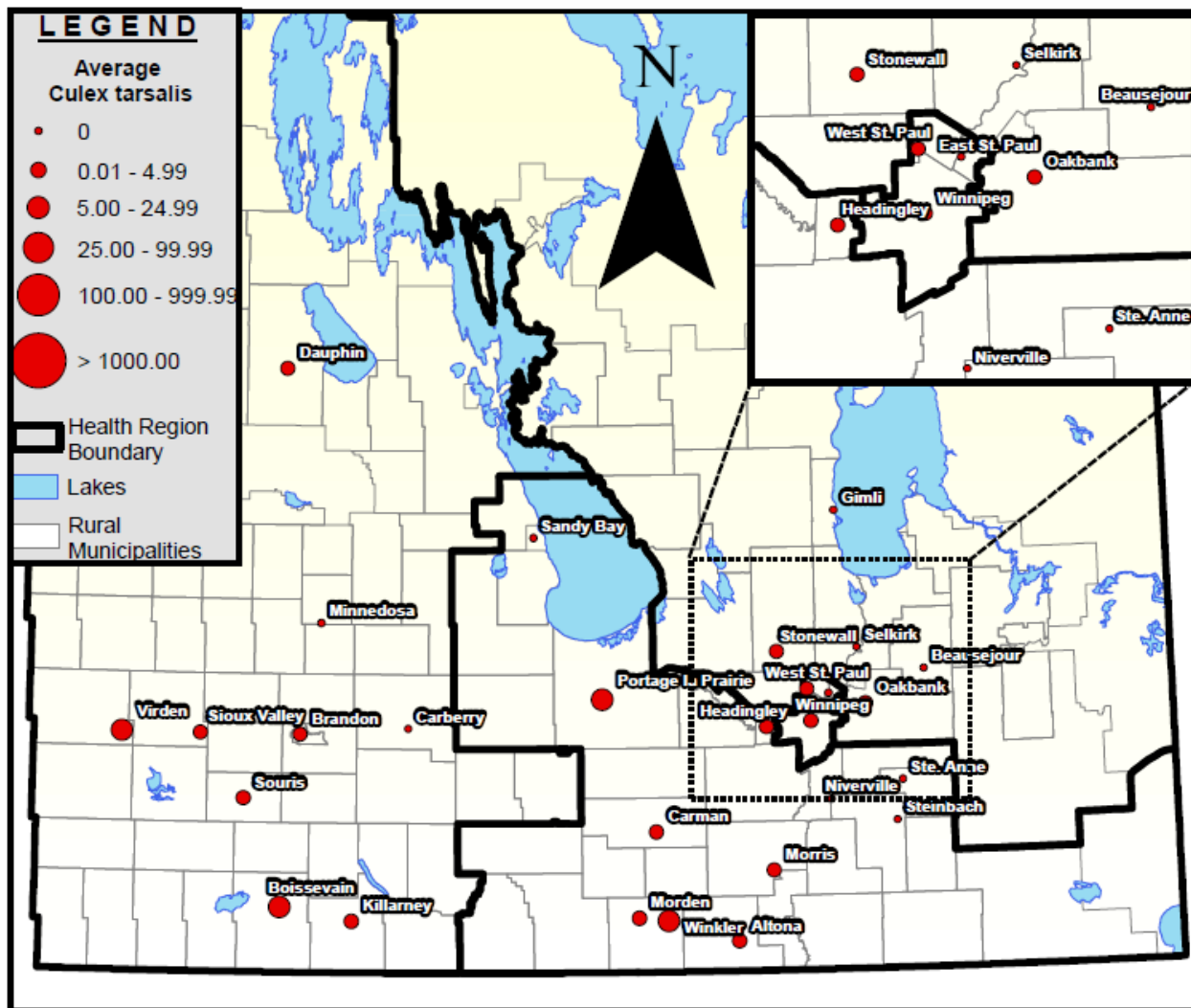
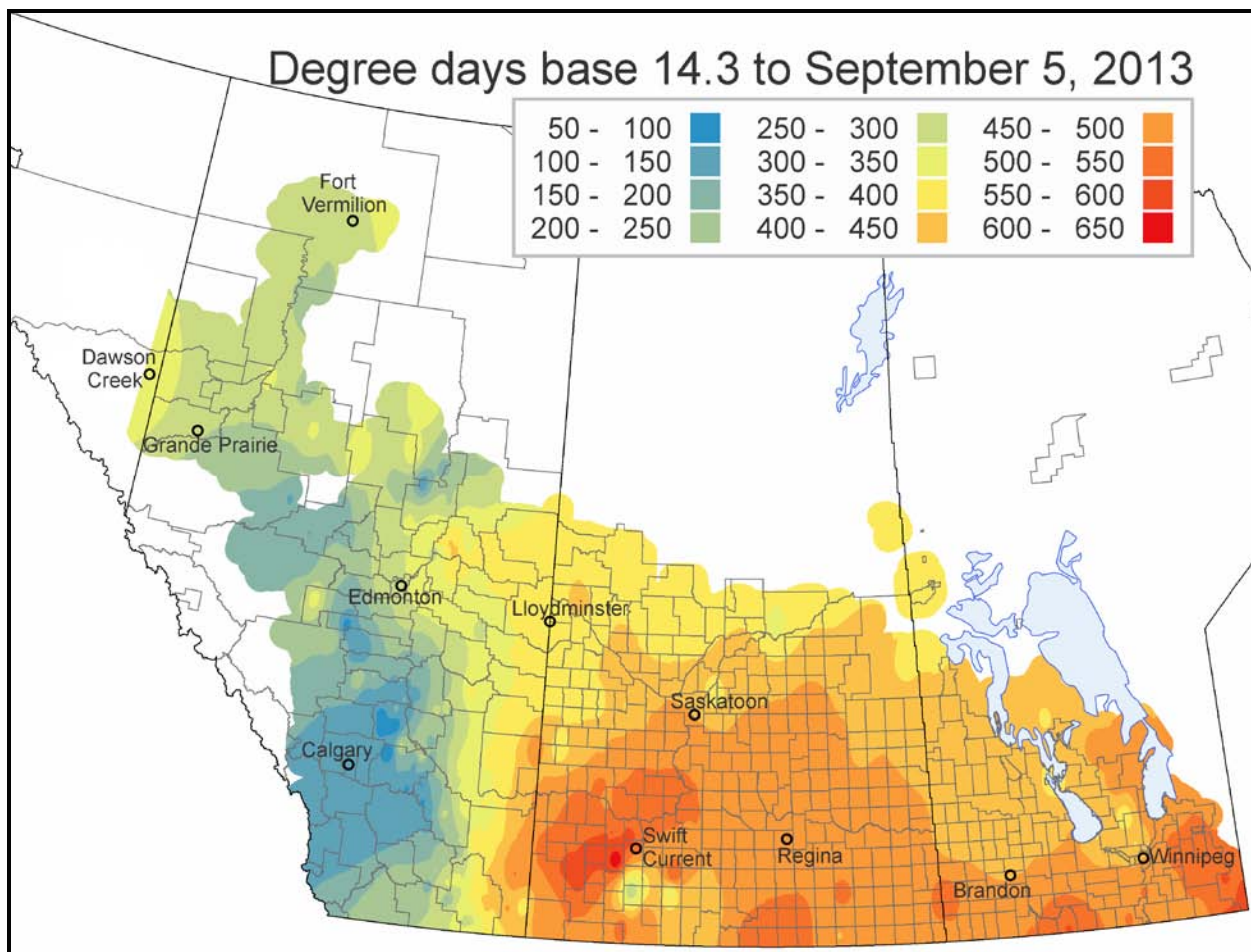


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during week 36.



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

Figure 3 - Degree day accumulations, as of week 36, 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 36)

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	1	1
Prairie Mountain	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
Winnipeg	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Totals	0	0	0	0	0	0	0	0	0	1	0	0	1	2

* 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 36)

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	2	117
Prairie Mountain	5	1	9	15	24	28	32	20	29	21	43	33	15	275
Southern	6	5	22	24	40	58	74	45	45	29	42	29	17	436
Winnipeg	4	4	9	9	26	29	40	28	24	12	30	24	7	246
Weekly Totals	17	11	42	52	103	131	166	109	111	67	127	97	41	1074

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to week 36)

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)
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)	0 (0)	3 (1.1)
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)	0 (0)	12 (2.8)
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)	0 (0)	4 (1.6)
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)	0 (0)	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 36)

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
2013	19	2	<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	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 U.S. -

Canada:

- As of Week 36 a total of thirty-five (35) human WNV cases (4 in Alberta, 2 in Manitoba, 21 in Ontario, 7 in Quebec and 1 in Saskatchewan), two-hundred and seventy-one (271) WNV positive mosquito pools (1 in British Columbia, 19 in Manitoba, 179 in Ontario, 36 in Quebec and 36 in Saskatchewan), forty (40) WNV positive birds (1 in British Columbia, 1 in Manitoba, 24 in Ontario, 6 in Quebec and 8 in Saskatchewan) and eleven (11) WNV positive animals including nine horses (3 in Alberta, 1 in Manitoba, 2 in Ontario and 3 in Saskatchewan) 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 36 a total of six-hundred and ninety-six (696) human WNV cases have been reported in the United States, including twenty-eight (28) deaths.
- As of Week 36 a total of 9,181 WNV positive mosquito pools, 1,203 WNV positive birds and 109 positive horses have been identified across the United States.

- As of Week 36 Minnesota is reporting forty-nine (49) human WNV cases (including two death), forty-eight (48) WNV positive mosquito pools, one (1) WNV positive bird and one (2) WNV positive horse;
- As of Week 36 North Dakota is reporting thirty-nine (39) human WNV cases (including one death), twenty (20) WNV positive mosquito pools and six (6) WNV positive birds;
- As of Week 36 South Dakota is reporting eighty-seven (87) human WNV cases (including two deaths), 365 WNV positive mosquito pools, eight (8) WNV positive birds and three (3) 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 36.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds ****
Manitoba	2	19	1	1
Saskatchewan	1	36	3	8
Alberta	4	N/A**	3	N/A
North Dakota	39	20	0	6
South Dakota	87	365	3	8
Minnesota	49	48	2	1
Ontario	21	179	3	24
British Columbia	0	1	0	1
Quebec	7	36	1	6
Maritimes	0	N/A	0	N/A
TOTAL	210	704	16	55

* 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.