MANITOBA HEALTH, HEALTHY LIVING & SENIORS

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, Healthy Living & Seniors (MHHLS) 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 MHHLS.
    - Human cases are included in the Weekly WNV Surveillance Report based on the date they are reported to MHHLS. 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 MHHLS 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 MHHLS 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 36* (August 31 – September 6) Manitoba Health, Healthy Living & Seniors detected two (2) additional WNV positive mosquito pools (Figure 1). The positive pools were collected from communities within the Prairie Mountain and Winnipeg Health Regions.
- There were no additional WNV positive indicators detected (e.g. human or horse) detected during Week 36.
    - To date (as of Week 36) a total of 24 WNV positive mosquito pools have been detected from eleven sentinel communities.
    - As of Week 36 there have been two** (2) human cases and no horse WNV cases reported in the province.
- *Culex tarsalis* mosquitoes were collected in twenty-one (21) out of twenty-nine (29) sentinel communities. In comparison to the previous week, the average *Culex tarsalis* numbers decreased across the province during Week 36 with the most noticeable decline seen within communities in the Interlake-Eastern Heath Region (Table 1 & 2; Figure 2).

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

***** Please note: exposure for one of the human cases likely occurred prior to the 2014 WNV season.***

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 36)

Health Region	CDC Week								
	28	29	30	31	32	33	34	35	36
Interlake-Eastern	153.89	54.79	149.06	14.56	27.00	268.84	12.75	1.55	0.26
Prairie Mountain	2.40	3.97	24.51	11.10	27.74	34.72	31.38	2.11	2.72
Southern	91.05	21.95	49.20	56.79	152.93	175.67	110.70	34.42	5.30
Winnipeg	73.77	20.50	53.53	19.51	26.59	336.35	24.68	3.31	0.69
Provincial Average	**71.08**	**21.59**	**57.33**	**28.17**	**66.58**	**185.24**	**52.32**	**12.80**	**2.76**
	Indicates that one or more positive mosquito pools were detected within the health region.								

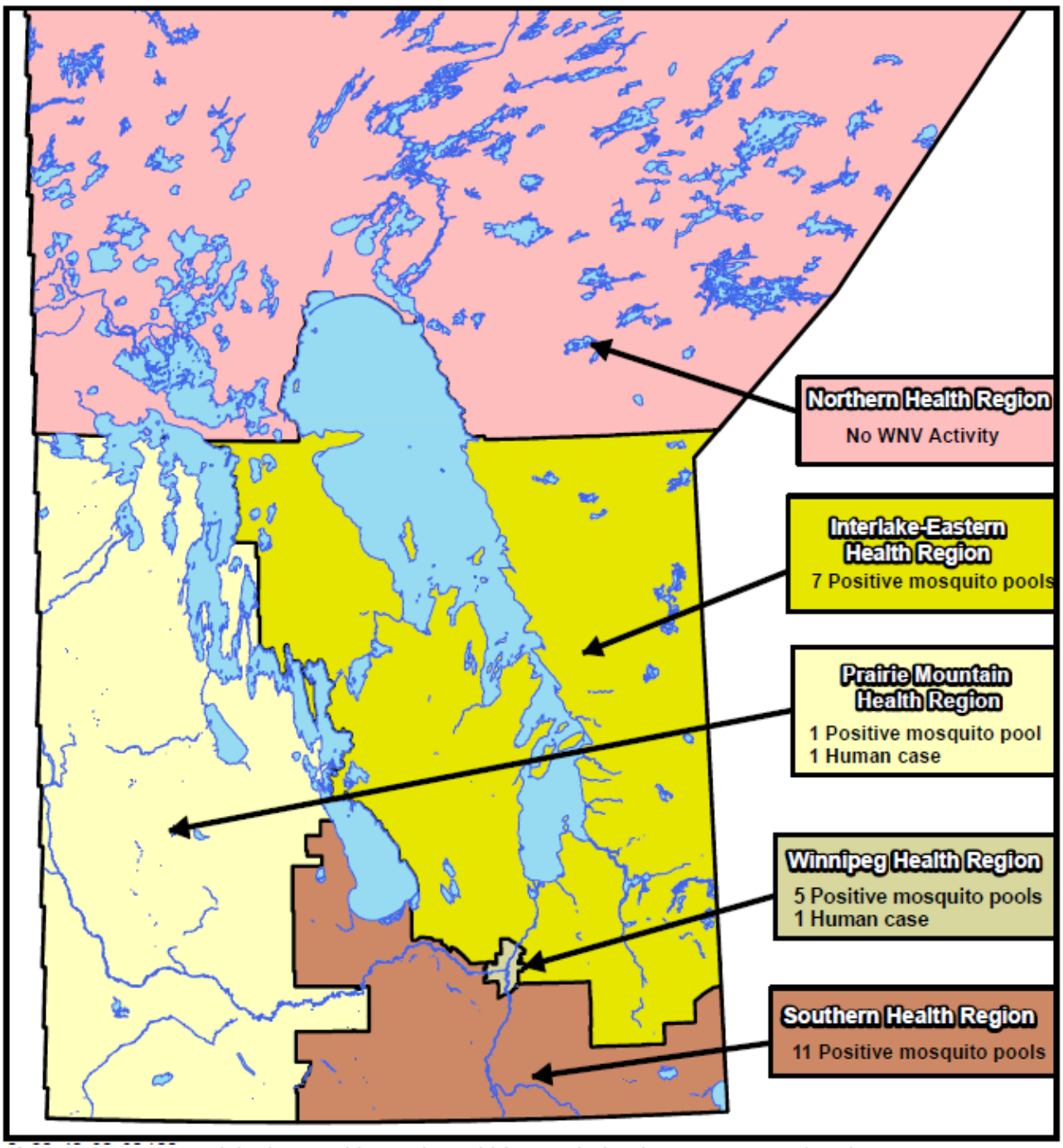


Figure 1 – WNV activity by Health Region within Manitoba (current to Week 36).

*Please note: *exposure for one of the human cases likely occurred prior to the 2014 WNV season.*

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	1.50	8.25
	Gimli	0.00	0.00	5.00
	Oakbank	0.00	1.25	6.25
	Selkirk	1.33	2.75	16.25
	Stonewall	0.25	2.25	28.00
Prairie Mountain	Boissevain	3.25	7.50	**115.75**
	Brandon	1.90	0.33	25.30
	Carberry	0.50	0.50	5.50
	Dauphin	0.00	0.33	2.50
	Killarney	0.00	4.25	14.50
	Minnedosa	0.25	0.00	0.25
	Sioux Valley FN	6.00	1.00	50.50
	Souris	3.33	1.75	33.75
	Virden	**12.00**	4.50	53.00
Southern	Altona	1.50	28.50	57.00
	Carman	3.00	19.25	35.75
	Headingley	0.50	1.50	63.00
	Morden	3.50	**101.50**	70.00
	Morris	0.50	8.50	45.50
	Niverville	0.00	2.67	8.00
	Portage la Prairie	**51.33**	**79.75**	**1087.33**
	Roseau River FN	0.00	1.25	9.67
	Ste. Anne	0.25	0.00	1.75
	Sandy Bay FN	1.75	0.75	33.75
	Steinbach	0.25	0.25	8.25
	Winkler	**9.25**	**144.75**	**103.50**
Winnipeg	East St Paul	0.00	0.00	8.50
	West St Paul	1.00	5.00	49.50
	Winnipeg	0.72	3.41	23.43
	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.

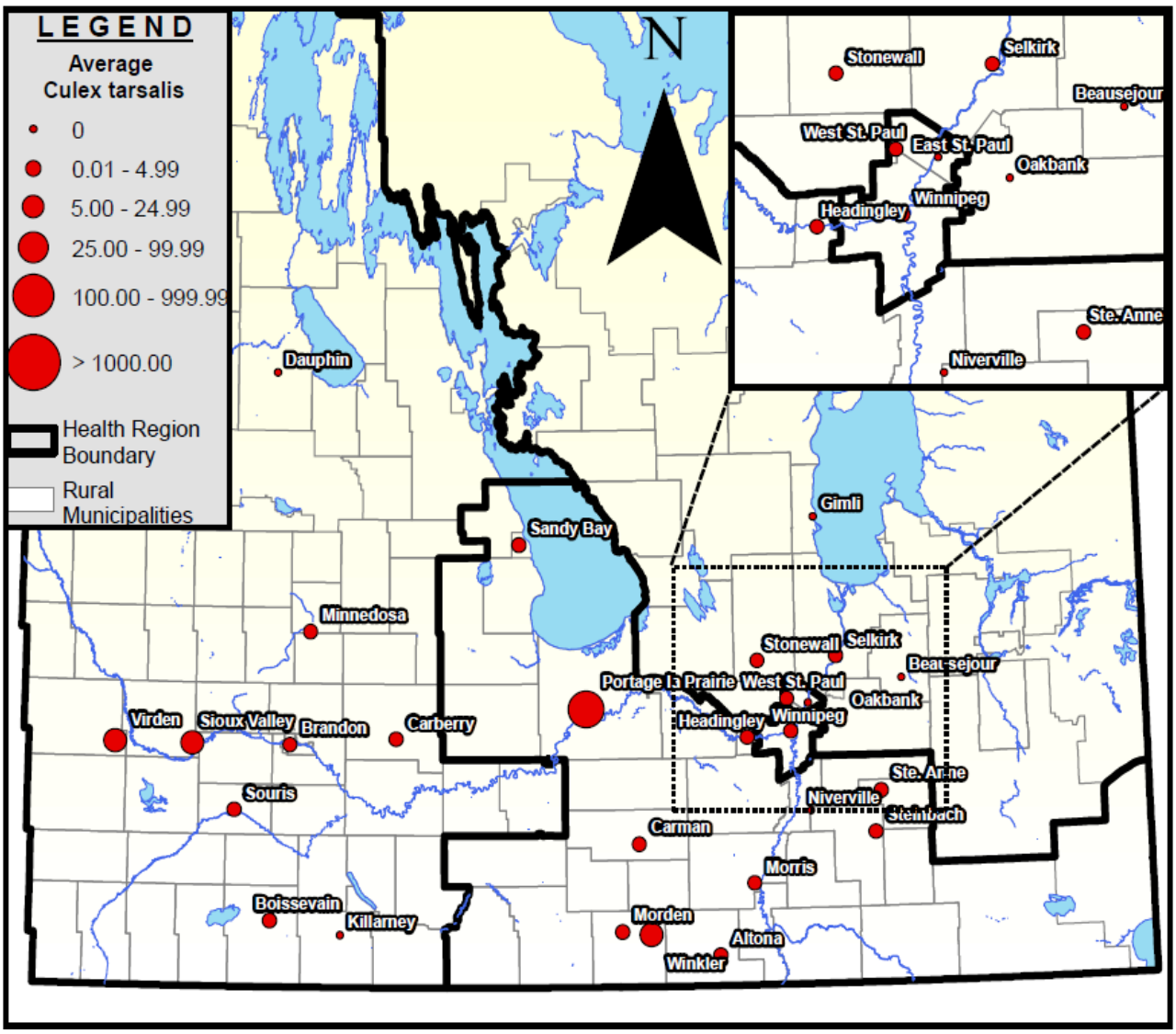
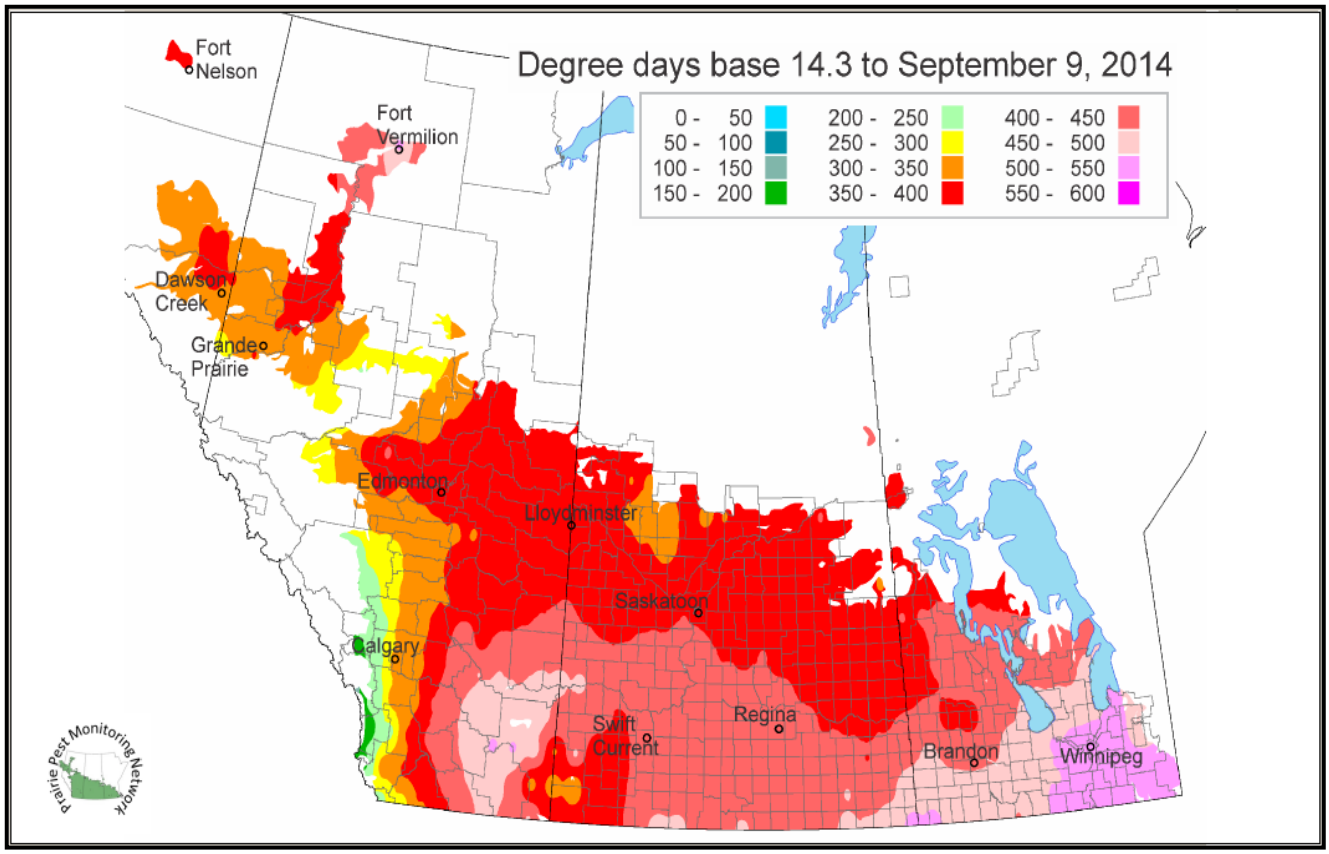


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during Week 36.



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, Healthy Living & Seniors by laboratories (current to Week 36).

Health Region	CDC Week												Totals
	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	1**	0	0	**1**
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**	**2**	**0**	**0**	**2**

***** 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.
** Note that this case was likely exposed prior to the 2014 WNV season.

Table 4 – Total number of *Culex tarsalis* mosquito pools tested during the 2014 season by health region (current to Week 36)

Health Region	CDC Week											Totals
	26	27	28	29	30	31	32	33	34	35	36	
Interlake-Eastern	6	16	25	27	27	18	22	62	20	12	3	**246**
Prairie Mountain	13	7	16	29	34	35	39	45	47	18	17	**302**
Southern	24	28	55	40	46	56	66	84	58	49	25	**564**
Winnipeg	19	25	32	25	35	32	37	84	36	20	11	**377**
Weekly Totals	**62**	**76**	**128**	**121**	**142**	**141**	**164**	**275**	**161**	**99**	**56**	**1489**

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
	28	29	30	31	32	33	34	35	36	
Interlake-Eastern	0 (0)	0 (0)	2 (7.4)	2 (11.1)	0 (0)	2 (3.2)	1 (5)	0 (0)	0 (0)	**7 (2.8)**
Prairie Mountain	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5.9)	**1 (0.3)**
Southern	0 (0)	0 (0)	0 (0)	2 (3.6)	1 (1.5)	2 (2.4)	3 (5.2)	3 (6.1)	0 (0)	**11 (2.0)**
Winnipeg	0 (0)	0 (0)	0 (0)	1 (3.1)	0 (0)	2 (2.4)	1 (2.8)	0 (0)	1 (9.1)	**5 (1.3)**
Weekly Totals	**0 (0)**	**0 (0)**	**2 (1.4)**	**5 (3.5)**	**1 (0.6)**	**6 (2.2)**	**5 (3.2)**	**3 (3)**	**2 (3.6)**	**24 (1.6)**

***** 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)

	Cumulative (Year-to-Date) Amount		Year End Totals	
Year	**Positive Mosquito Pools**	**Human WNV Cases**	**Positive Mosquito Pools**	**Human WNV Cases**
2014	***24***	***2****	***TBD***	***TBD***
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

* Please note exposure for one of the human cases likely occurred prior to the 2014 WNV season.

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

Canada:

- As of Week 36 eight (8) human WNV case (2 in Manitoba, 2 in Ontario, and 4 in Saskatchewan), one hundred and twenty-six (126) WNV positive mosquito pools (24 in Manitoba, 43 in Ontario, 39 in Quebec and 20 in Saskatchewan), seven (7) WNV positive birds (2 in Saskatchewan, 4 in Ontario and 1 in Quebec) and four (4) WNV positive horses (1 in Alberta and 3 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 36 a total of 579 human WNV cases, including twenty-three (23) deaths, have been reported in the United States. In addition 9,456 WNV positive mosquito pools, 1,957 WNV positive birds and forty-three (43) WNV positive horses have been identified across the United States.

- As of Week 36 Minnesota is reporting six (6) WNV human cases, seventeen (17) WNV positive mosquito pools, one (1) WNV positive horse and two (2) WNV positive birds (Table 7).
- As of Week 36 North Dakota is reporting nine (9) WNV human cases, six (6) WNV positive mosquito pools and four (4) WNV positive horses.
- As of Week 36 South Dakota is reporting thirty-one (31) WNV human cases and fifty-seven (57) WNV positive mosquito pools, one (1) WNV positive horse, and one (1) WNV positive bird (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******	**24**	**0**	**0**
Saskatchewan	4	20	3	2
Alberta	0	N/A**	1	N/A
North Dakota	9	6	4	0
South Dakota	31	57	1	1
Minnesota	6	17	1	2
Ontario	2	43	0	4
British Columbia	0	0	0	0
Quebec	0	39	0	1
Maritimes	0	N/A	0	N/A
TOTAL	**54**	**206**	**10**	**10**

* 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.
**** One of these cases was likely exposed prior to the 2014 WNV season.

- 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^{o}C. Degree days are calculated by taking the daily mean temperature and subtracting the cut-off threshold:

EXAMPLE: *Mean Temperature* = 19.3^{o}C; *Degree Day threshold* = 14.3^{o}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.