MANITOBA HEALTH

WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 30)

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 30* (July 21 – 27) Manitoba Health detected seven (7) positive mosquito pools from six communities across three Health Regions (Figure 1). In addition one WNV positive bird was identified from the Prairie Mountain Health Region**.
    - To date (as of week 30) a total of 10 WNV positive mosquito pools have been detected from seven communities.
    - As of week 30 there have been no human or horse WNV cases reported in Manitoba.
- *Culex tarsalis* mosquitoes were collected from all twenty-nine surveillance communities across all four southern Manitoba Health Regions in Week 30 (Table 1 & 2; Figure 2). The numbers of *Culex tarsalis* collected during week 30 at the provincial level are similar to the previous week and the highest averages continue to be observed in the Southern Health Region.

**** 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 30)

Health Region	CDC Week												
	23	24	25	26	27	28	29	30	31	32	33	34	35
Interlake-Eastern	0.0	0.21	0.05	0.15	0.50	3.70	17.80	20.70					
Prairie Mountain	0.0	0.22	0.03	0.73	0.97	9.40	9.00	16.20					
Southern	0.0	0.17	0.18	3.24	7.65	17.70	70.80	67.20					
Winnipeg	0.0	0.12	0.15	0.35	0.81	15.10	31.10	26.30					
Provincial Average	**0.0**	**0.17**	**0.11**	**1.38**	**3.10**	**12.70**	**36.40**	**36.10**					
	Indicates that one or more positive mosquito pools were detected within the health region.												

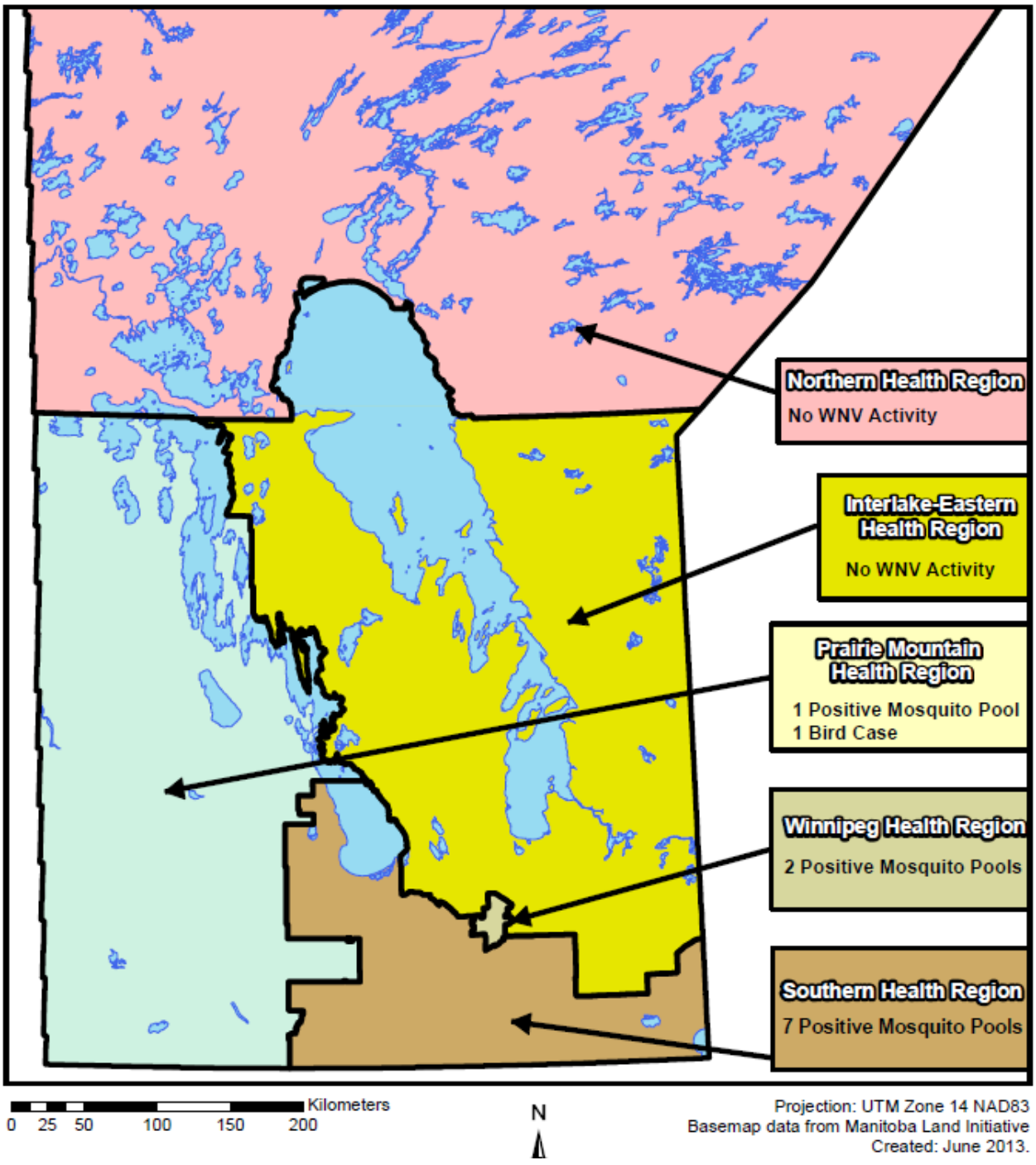


Figure 1 – WNV activity by Health Region within Manitoba (current to week 30).

Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community* in southern Manitoba – three week trend (current to week 30).

Health Region	Community	Week 30	Week 29	Week 28
Interlake-Eastern	Beausejour	11.80	20.00	2.80
	Gimli	4.30	1.50	0.80
	Oakbank	25.80	22.80	10.80
	Selkirk	33.50	5.80	2.00
	Stonewall	28.00	39.80	2.00
Prairie Mountain	Boissevain	82.80	27.00	38.30
	Brandon	2.80	1.20	0.60
	Carberry	10.30	6.80	8.80
	Dauphin	1.70	1.00	0.00
	Killarney	22.00	2.30	2.00
	Minnedosa	0.30	2.00	0.00
	Sioux Valley FN	3.00	28.30	8.50
	Souris	18.00	6.30	3.80
	Virden	10.50	26.50	**49.00**
Southern	**Altona**	**126.30**	119.00	27.50
	Carman	8.80	30.80	5.50
	Headingley	16.00	0.00	12.00
	Morden	113.30	88.00	23.80
	Morris	**219.00**	**147.50**	37.50
	Niverville	59.00	34.30	4.00
	Portage la Prairie	**117.50**	**168.00**	**54.50**
	Roseau River FN	17.00	33.30	5.30
	Ste. Anne	40.30	23.80	0.00
	Sandy Bay FN	3.00	1.80	0.50
	Steinbach	28.50	50.30	6.30
	Winkler	95.30	**137.30**	28.50
Winnipeg	East St Paul	24.50	0.00	3.00
	West St Paul	58.50	No Trapping**	**132.00**
	Winnipeg	24.10	32.30	11.80
	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.
** Traps not operational due to mechanical issues.

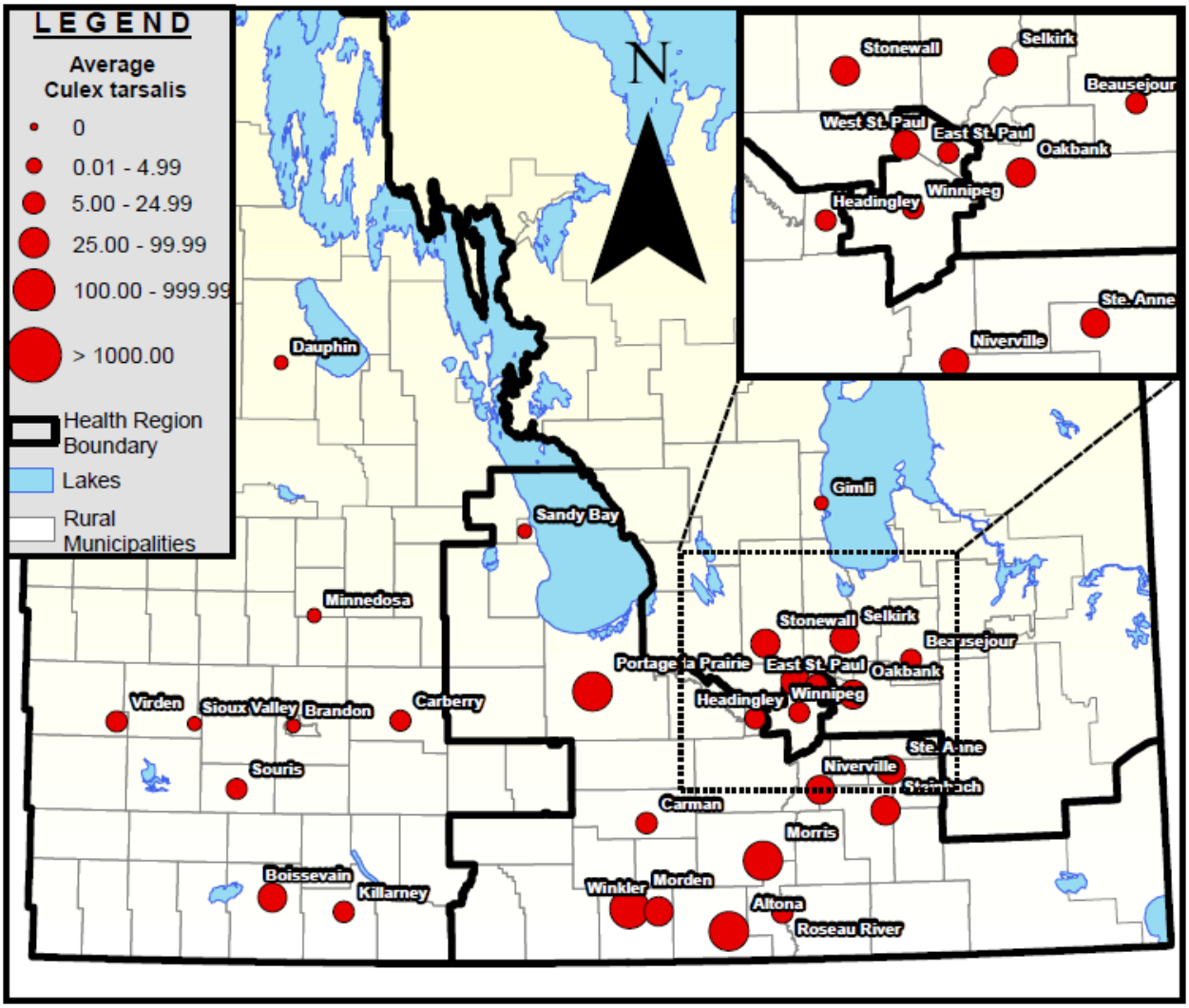
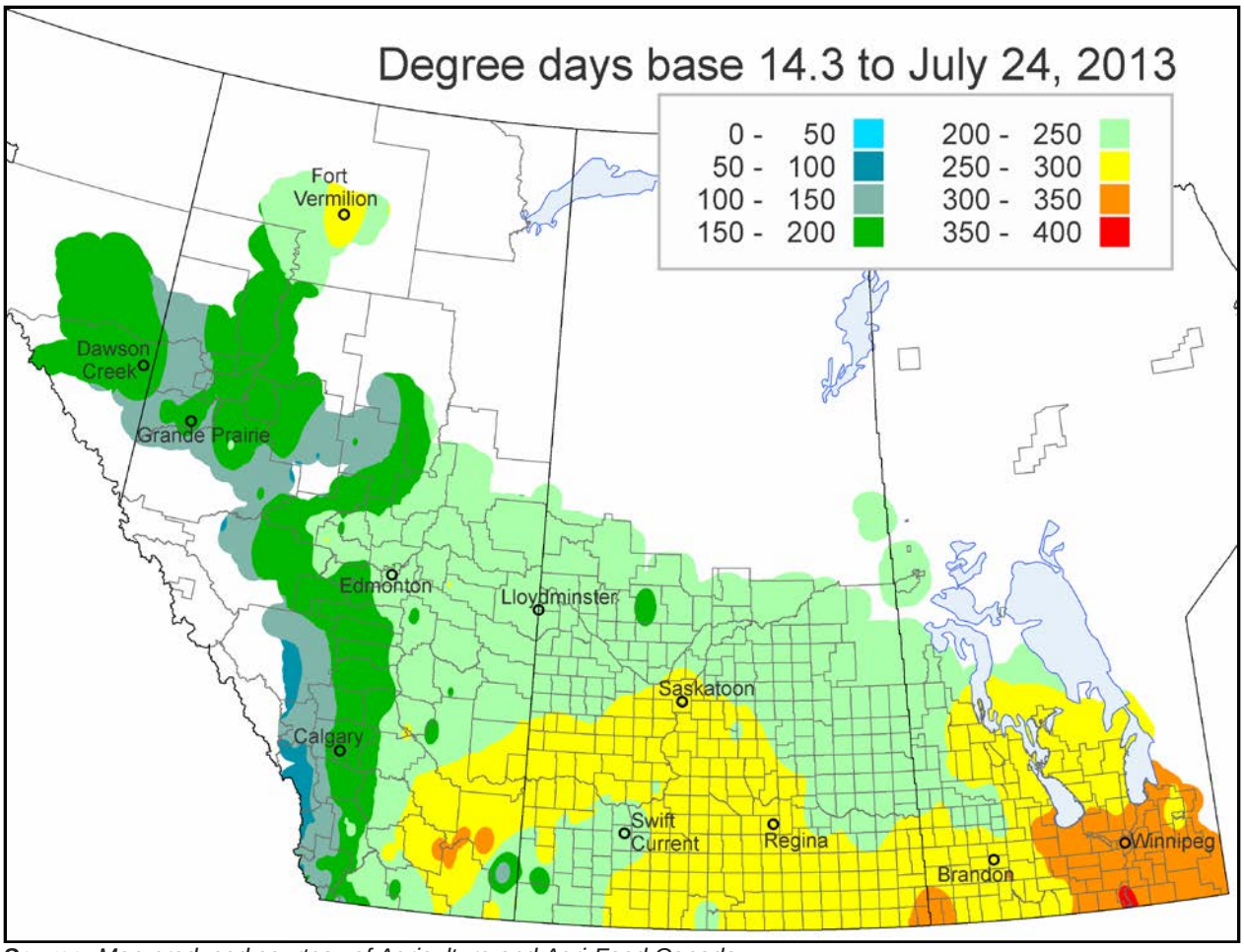


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during week 30.



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

Figure 3 - Degree day accumulations, as of week 30, 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 30)

Health Region	CDC Week													Totals
	23	24	25	26	27	28	29	30	31	32	33	34	35	
Interlake-Eastern	0	0	0	0	0	0	0	0						**0**
Prairie Mountain	0	0	0	0	0	0	0	0						**0**
Southern	0	0	0	0	0	0	0	0						**0**
Winnipeg	0	0	0	0	0	0	0	0						**0**
Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

***** 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 30)

RHA	CDC Week													Totals
	23	24	25	26	27	28	29	30	31	32	33	34	35	
Interlake-Eastern	0	2	1	2	4	13	16	20						**58**
Prairie Mountain	0	5	1	9	15	24	28	32						**114**
Southern	0	6	5	22	24	40	58	74						**229**
Winnipeg	0	4	4	9	9	26	29	40						**121**
Weekly Totals	**0**	**17**	**11**	**42**	**52**	**103**	**131**	**166**	**0**	**0**	**0**	**0**	**0**	**522**

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to week 30)

Health Region	CDC Week													Totals
	23	24	25	26	27	28	29	30	31	32	33	34	35	
Interlake-Eastern	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)	0 (0)	1 (3.1)						**1 (1.0)**
Southern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2.5)	2 (3.4)	4 (5.4)						**7 (3.1)**
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5.0)						**2 (2.0)**
Weekly Totals	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**1 (1.0)**	**2 (1.5)**	**7 (4.2)**						**10 (1.9)**

***** 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 30)

	Cumulative (Year-to-Date) Amount		Year End Totals	
Year	**Positive Mosquito Pools**	**Human WNV Cases**	**Positive Mosquito Pools**	**Human WNV Cases**
2013	**10**	**0**	***TBD***	***TBD***
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 30 a total of forty (40) WNV positive mosquito pools (10 in Manitoba, 22 in Ontario and 8 in Saskatchewan) and seven (7) WNV positive birds (1 in Manitoba, 1 in Ontario and 5 in Saskatchewan) have been detected (Table 7).
    - The first human WNV case in Canada was reported in Ontario (Table 7).
    - To date there have been no horse cases 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 30 a total of fifty-three (53) human WNV cases have been reported in the United States, including three deaths.
- As of Week 30 a total of 1,940 WNV positive mosquito pools, 396 WNV positive birds and 13 positive horses have been identified across the United States.
    - As of Week 30 Minnesota is reporting three (3) human WNV cases, nine (9) WNV positive mosquito pools and one (1) WNV positive bird; North Dakota is reporting one (1) human WNV case, six (6) WNV positive mosquito pools and three (3) WNV positive birds; South Dakota is reporting twelve (12) human WNV

cases, 136 WNV positive mosquito pools, one (1) WNV positive bird and one (1) WNV positive horse (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 30.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds
Manitoba	**0**	**10**	**0**	**1****
Saskatchewan	0	8	0	5
Alberta	0	N/A**	0	N/A
North Dakota	1	6	0	2
South Dakota	12	136	1	1
Minnesota	3	9	0	1
Ontario	1	22	0	1
British Columbia	0	0	0	0
Quebec	0	0	0	0
Maritimes	0	N/A	0	N/A
TOTAL	**17**	**191**	**1**	**11**

***** 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^{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.