MANITOBA HEALTH, HEALTHY LIVING & SENIORS

WEEKLY WEST NILE VIRUS SURVEILLANCE REPORT (WEEK 33)

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 but can be found on the website (www.gov.mb.ca/health/wnv/stats.html).
- **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 of mosquito pool & degree days consult Appendix 2.***

- WNV Provincial Surveillance Data -

- During Week 33* (August 16 – 22) Manitoba Health, Healthy Living & Seniors (MHHLS) detected nine WNV positive mosquito pools from communities within the Interlake-Eastern (Oakbank), Prairie Mountain (Boissevain), Southern (Altona, Morris, Portage la Prairie and Ste Anne) and Winnipeg Health Regions (Winnipeg) Health Regions (Figure 1).
- To date MHHLS surveillance has detected twenty-eight WNV positive mosquito pools from communities in all four of the southern Manitoba Health Regions. There have been no positive WNV human or horse cases detected to date in 2015.
- In Week 33 *Culex tarsalis* numbers at the provincial level increased compared to the previous week, and activity was again detected in all twenty-nine sentinel communities spread across all four southern Manitoba Health regions; Interlake-Eastern, Prairie Mountain, Southern and Winnipeg (Table 1 & 2; Figure 2).
- *Culex tarsalis* numbers were highest in both the Prairie Mountain and Southern Health Regions.

**** For a listing of CDC surveillance weeks and corresponding dates for the 2015 please see Appendix 1.***

2014 Year-End WNV Surveillance Data*

- *With the detection of WNV activity in Manitoba in Week 28 the 2014 Year-End WNV Surveillance summary will no longer be included in the current, or future, weekly surveillance reports. The 2014 Year-End Surveillance summary can be found in earlier 2015 weekly surveillance reports.*

Table 1 – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to Week 33)

Health Region	CDC Week									
	25	26	27	28	29	30	31	32	33	34
Interlake-Eastern	2.15	3.25	3.22	20.76	18.83	38.82	92.47	34.37	66.89	
Prairie Mountain	0.10	1.18	0.30	9.84	22.53	19.26	45.28	23.65	81.93	
Southern	3.47	10.98	11.44	37.17	26.76	208.05	246.13	83.02	107.39	
Winnipeg	1.15	2.69	3.09	29.54	14.97	95.61	115.16	61.31	51.92	
Provincial Average	**1.73**	**4.94**	**5.14**	**24.82**	**21.59**	**103.16**	**134.77**	**53.39**	**80.55**	
	Indicates that one or more positive mosquito pools were detected within the health region.									

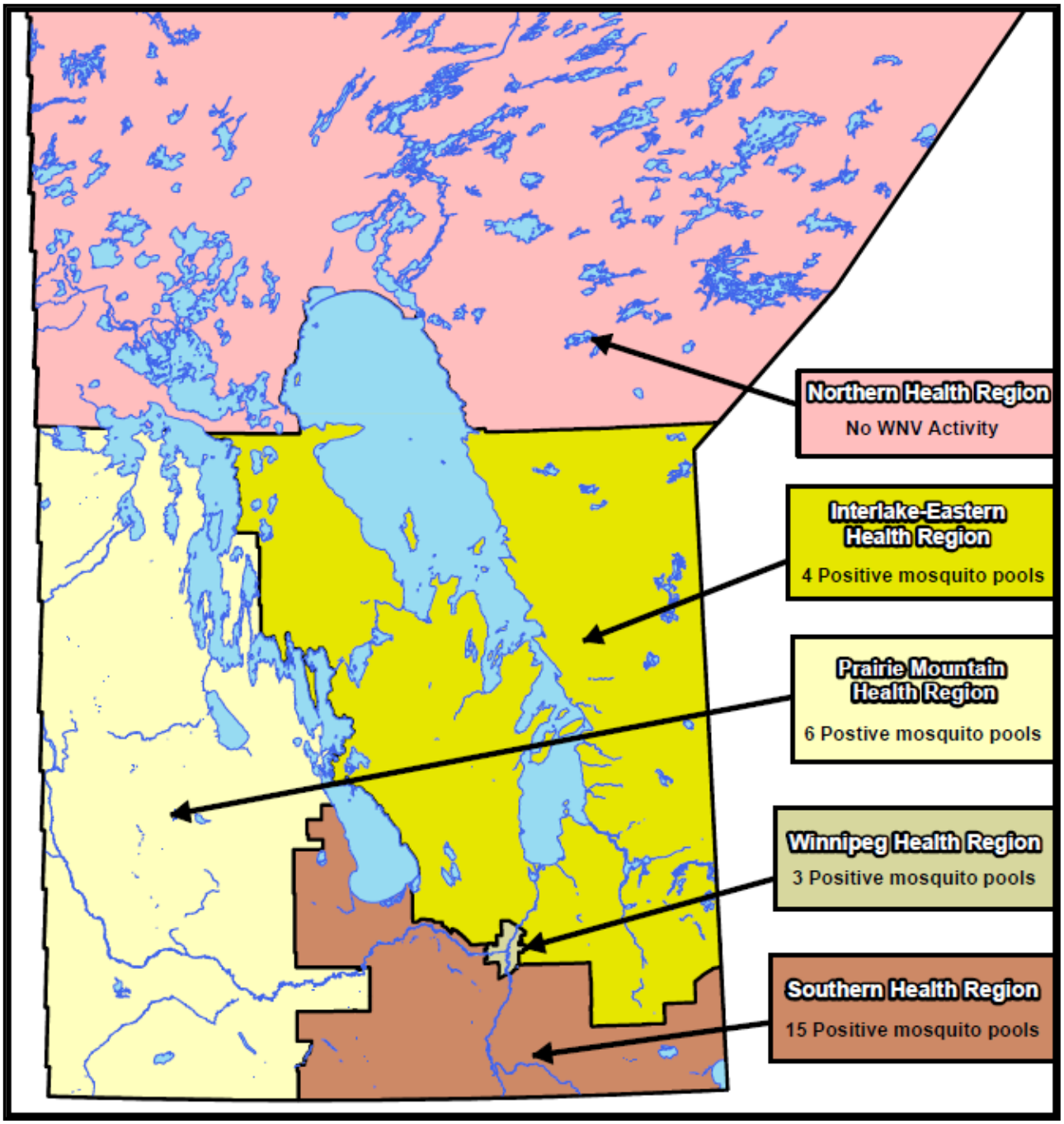


Figure 1 – WNV activity by Health Region within Manitoba (current to Week 33).

Table 2 – Average number of *Culex tarsalis* mosquitoes collected by surveillance community* in southern Manitoba – three week trend (current to Week 33).

Health Region	Community	Week 33	Week 32	Week 31
Interlake-Eastern	Beausejour	8.25	1.33	45.50
	Gimli	12.33	1.25	36.00
	Oakbank	80.75	50.50	85.75
	Selkirk	136.50	86.00	180.00
	Stonewall	83.00	24.50	122.67
Prairie Mountain	**Boissevain**	**440.25**	73.50	182.00
	Brandon	22.30	11.40	11.70
	Carberry	76.75	52.25	72.00
	Dauphin	7.75	4.75	3.50
	Killarney	86.25	34.75	46.00
	Minnedosa	4.25	1.25	6.50
	Sioux Valley FN	24.50	37.50	36.50
	Souris	44.50	1.00	17.25
	Virden	91.50	21.75	78.00
Southern	Altona	139.00	64.67	191.50
	Carman	20.50	111.75	188.50
	Headingley	10.00	0.00	24.00
	Morden	41.50	86.00	150.50
	Morris	**167.00**	121.75	206.50
	Niverville	160.75	**118.50**	**359.75**
	Portage la Prairie	166.00	**196.67**	**842.50**
	Roseau River FN	36.75	106.75	200.75
	Ste. Anne	**410.25**	62.00	94.00
	Sandy Bay FN	2.00	7.00	14.50
	Steinbach	49.00	20.33	**289.75**
	Winkler	37.25	67.50	242.25
Winnipeg	East St Paul	34.50	16.00	38.00
	West St Paul	101.00	**163.50**	235.50
	Winnipeg	49.94	57.65	112.07
	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.

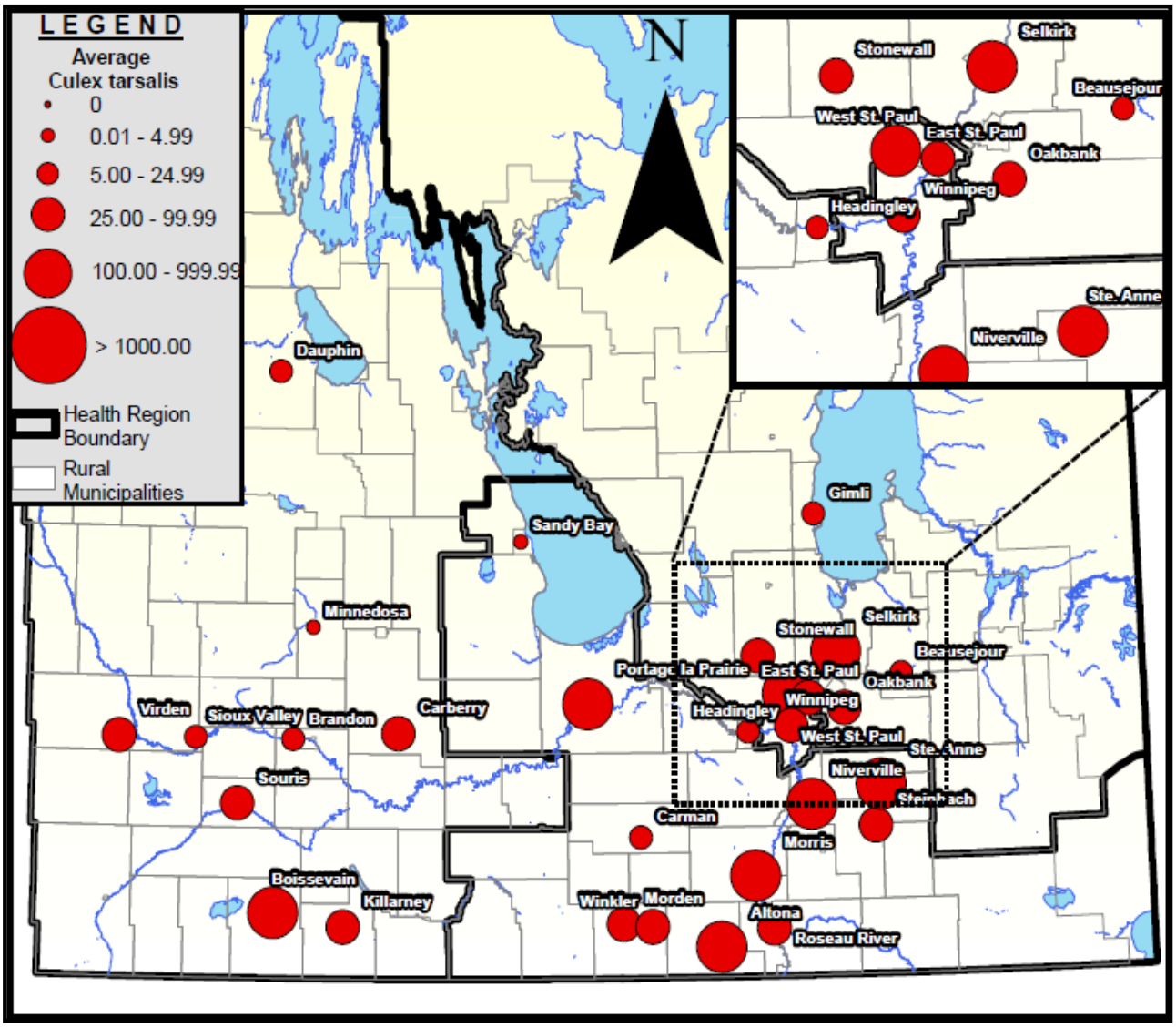
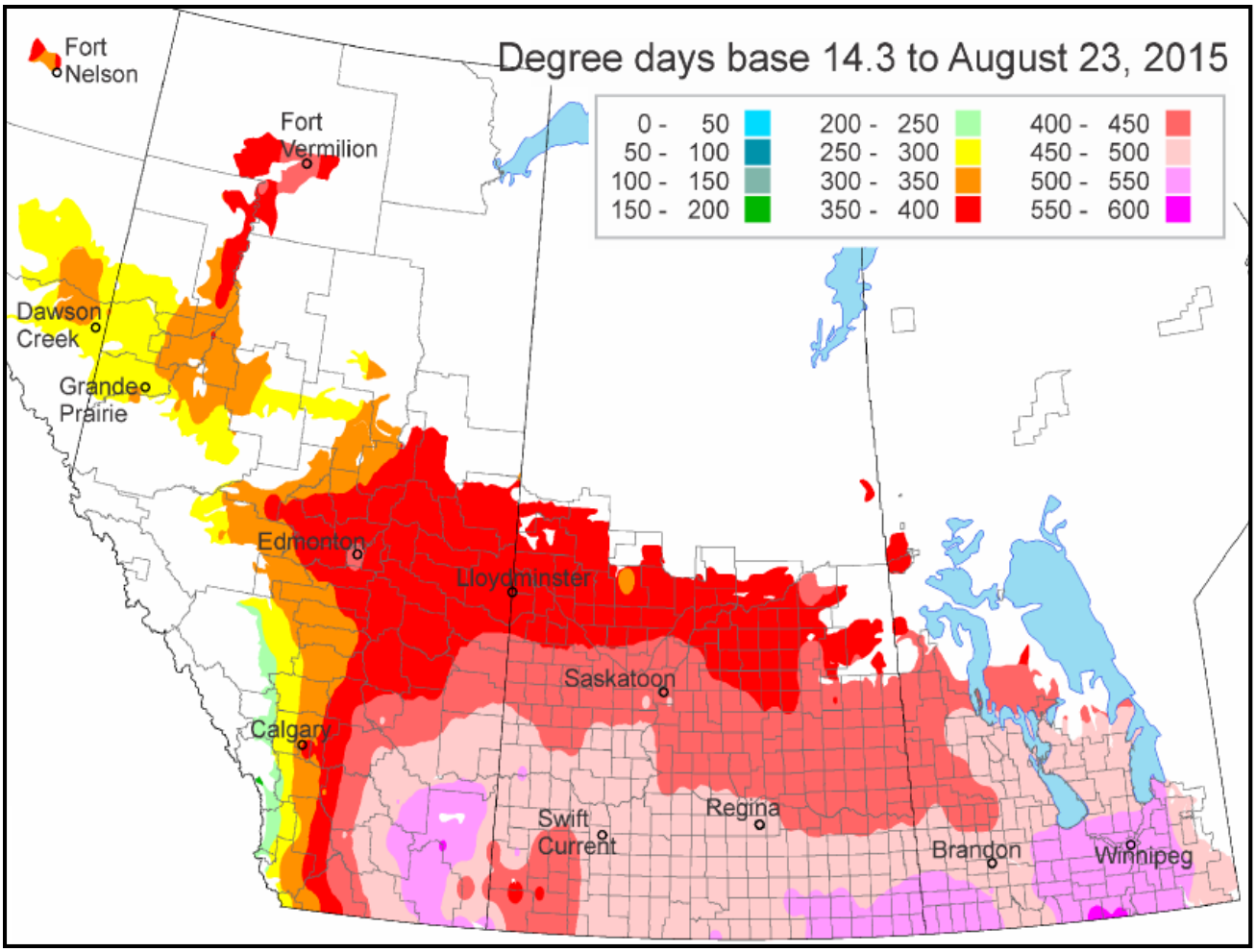


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during Week 33.



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

Figure 3 - Degree day accumulations, as of Week 33, 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 33)

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

***** 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.

Table 4 – Total number of *Culex tarsalis* mosquito pools tested during the 2015 season by health region (current to Week 33)

RHA	CDC Week									Totals
	25	26	27	28	29	30	31	32	33	
Interlake-Eastern	11	13	14	18	20	19	40	23	32	**223**
Prairie Mountain	4	14	5	26	43	39	58	41	61	**306**
Southern	20	36	36	54	43	102	115	81	86	**647**
Winnipeg	9	12	18	34	33	44	62	50	49	**374**
Weekly Totals	**44**	**75**	**73**	**132**	**139**	**204**	**275**	**195**	**228**	**1551**

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to Week 33)

Health Region	CDC Week									Totals
	25	26	27	28	29	30	31	32	33	
Interlake-Eastern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2.5)	0 (0)	3 (9.4)	**4 (1.8)**
Prairie Mountain	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5.1)	2 (3.4)	1 (2.4)	1 (1.6)	**6 (2.0)**
Southern	0 (0)	0 (0)	0 (0)	1 (1.9)	0 (0)	4 (3.9)	3 (2.6)	3 (3.7)	4 (4.7)	**15 (2.3)**
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2.3)	0 (0)	1 (2.0)	1 (2.0)	**3 (0.8)**
Weekly Totals	**0 (0)**	**0 (0)**	**0 (0)**	**1 (0.8)**	**0 (0)**	**7 (3.4)**	**6 (2.2)**	**5 (2.6)**	**9 (3.9)**	**28 (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 33)

	Cumulative (Year-to-Date) Amount		Year End Totals	
Year	**Positive Mosquito Pools**	**Human WNV Cases**	**Positive Mosquito Pools**	**Human WNV Cases**
2015	***28***	***0***	***TBD***	***TBD***
2014	14	0	24	5
2013	17	3	19	3
2012	108	33	116	39
2011	0	0	0	0
2010	19	0	20	0
2009	2	2	2	2
2008	31	10	41	12
2007	894	431	948	587
2006	161	41	171	51
2005	187	40	193	58
2004	54	3	57	3
2003	149	66	290	143

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

Canada:

- As of Week 33 six (6) human WVN cases (3 in Ontario and 3 in Quebec), ninety (90) WNV positive mosquito pools (28 in Manitoba, 48 in Ontario, 2 in Quebec and 12 in Saskatchewan), fourteen (14) positive birds (9 in Ontario and 5 in Quebec) and three (3) WNV positive horses (2 in Ontario and 1 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 33 a total of three-hundred and three (303) clinical WNV human cases, including seven (7) deaths, and seventy-five (75) presumptive viremic blood donors have been reported from thirty-eight states (Alabama, Arizona, Arkansas, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma,

Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, Wisconsin & Wyoming).

- Non-human WNV activity (non-human) has been detected to date in an additional 10 states (Connecticut, Kentucky, Massachusetts, Michigan, Oregon, Utah, Vermont and West Virginia).
    - As of Week 33 North Dakota is reporting four (4) WNV human cases, one (1) WNV positive horse and four (4) WNV positive mosquito pools (Table 7).
    - As of Week 33 South Dakota is reporting fifteen (15) WNV human cases (Table 7).
    - As of Week 33 Minnesota is reporting four (4) WNV human cases (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/mapviewer/

Table 7 – Positive human, mosquito, horse and bird West Nile Virus surveillance indicators across Canada and neighbouring US states as of Week 33.

Province/ State	Human Cases*	Positive Mosquito Pools	Veterinary ***	Birds
Manitoba	0	28	0	0
Saskatchewan	0	12	1	0
Alberta	0	N/A**	0	N/A
North Dakota	4	4	1	0
South Dakota	15	N/A	0	0
Minnesota	4	N/A	0	N/A
Ontario	3	48	2	9
British Columbia	0	0	0	0
Quebec	3	2	0	5
Maritimes	0	N/A	0	N/A
TOTAL	**29**	**94**	**4**	**14**

* Table numbers include travel related cases.
** Jurisdictions with N/A (not applicable) either do not maintain regular surveillance, or do not provide surveillance data on a weekly basis during the season.
*** Veterinary cases are primarily, but not all, horse cases.

- APPENDIX 1 -

Table 8 – 2015 CDC surveillance weeks

CDC Week Number	Dates	CDC Week Number	Dates
21	May 24 - May 30	30	July 26 - August 1
22	May 31 - June 6	31	August 2 - August 8
23	June 7 - June 13	32	August 9 - August 15
24	June 14 - June 20	33	August 16 - August 22
25	June 21 - Jun 27	34	August 23 - August 29
26	June 28 - July 4	35	August 30 - September 5
27	July 5 - July 11	36	September 6 - September 12
28	July 12 - July 18	37	September 13 - September 19
29	July 19 - July 25	38	September 20 - September 26

- 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.