

Manitoba Weekly

West Nile virus

Surveillance Report

Week 24 – (June 10 to 16, 2018)

Communicable Disease Control

Public Health Branch

Active Living, Indigenous Relations, Population &

Public Health Care Division

Manitoba Health, Seniors and Active Living

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About the Surveillance Report

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, Seniors and Active Living (MHSAL) 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 MHSAL.
 - Human cases are included in the Weekly WNV Surveillance Report based on the date they are reported to MHSAL. 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 with cases reported to MHSAL 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 Days¹ 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 MHSAL 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.

¹ For more detailed description of mosquito pools and degree days please consult **Appendix 2**.

WNV Provincial Surveillance Data

- Week 24 (June 10 – 16) was the second full trapping weekend of the 2018 season. Traps were run in all 29 sentinel communities.
 - Prior to Week 23, traps were only run in Winnipeg, and the surrounding communities of East St Paul, Headingley and West St Paul (Week 21 & 22).
- In Week 24, *Culex tarsalis* mosquitoes were collected in 26 sentinel communities. *Cx. tarsalis* activity was observed in all four southern Manitoba Health Regions (Table 1 & 2; Figure 2).
 - *Cx. tarsalis* activity was greatest in the Southern Health Region in Week 24.
- There were no positive mosquito pools detected in Week 24.

2017 Year-End WNV Surveillance Data*

- Five WNV human cases were reported to Manitoba Health, Seniors and Active Living, far fewer than in 2016. Cases were reported from all the Prairie Mountain, Southern and Winnipeg Health Regions.
- Two of the WNV cases were classified as the more severe West Nile neurological syndrome and three were classified as West Nile non-neurological syndrome.
 - Likely exposure ranged between Week 31 and 35.
 - There were no WNV related deaths in 2017.
- A total of 41 WNV positive mosquito pools were collected from 16 communities distributed across all four southern Manitoba Health Regions.
 - *Cx. tarsalis* numbers peaked in Week 31, but activity overall was lower than the average seen in low WNV activity years.
- More than 70% of the positive mosquito pools were reported from the Prairie Mountain and Winnipeg Health Regions.
- In 2017, there was one WNV horse case (Southern Health Region) and two WNV positive birds (Winnipeg Health Region).

* For a listing of CDC surveillance weeks and corresponding dates for 2018 please see Appendix 1.

Table 1 – Average number of *Culex tarsalis* mosquitoes captured by Health Region (current to Week 24)

Health Region	CDC Week									
	21	22	23	24	25	26	27	28	29	30
Interlake-Eastern	No trapping	No trapping	0.53	2.65						
Prairie Mountain	No trapping	No trapping	0.75	2.98						
Southern	0.00	0.00	1.09	6.24						
Winnipeg	0.00	0.80	0.79	3.76						
Provincial Average	0.00	0.78	0.85	4.21						
Historical Average	N/A	0.30	3.18	11.28						
	Indicates that one or more positive mosquito pools were detected within the health region.									

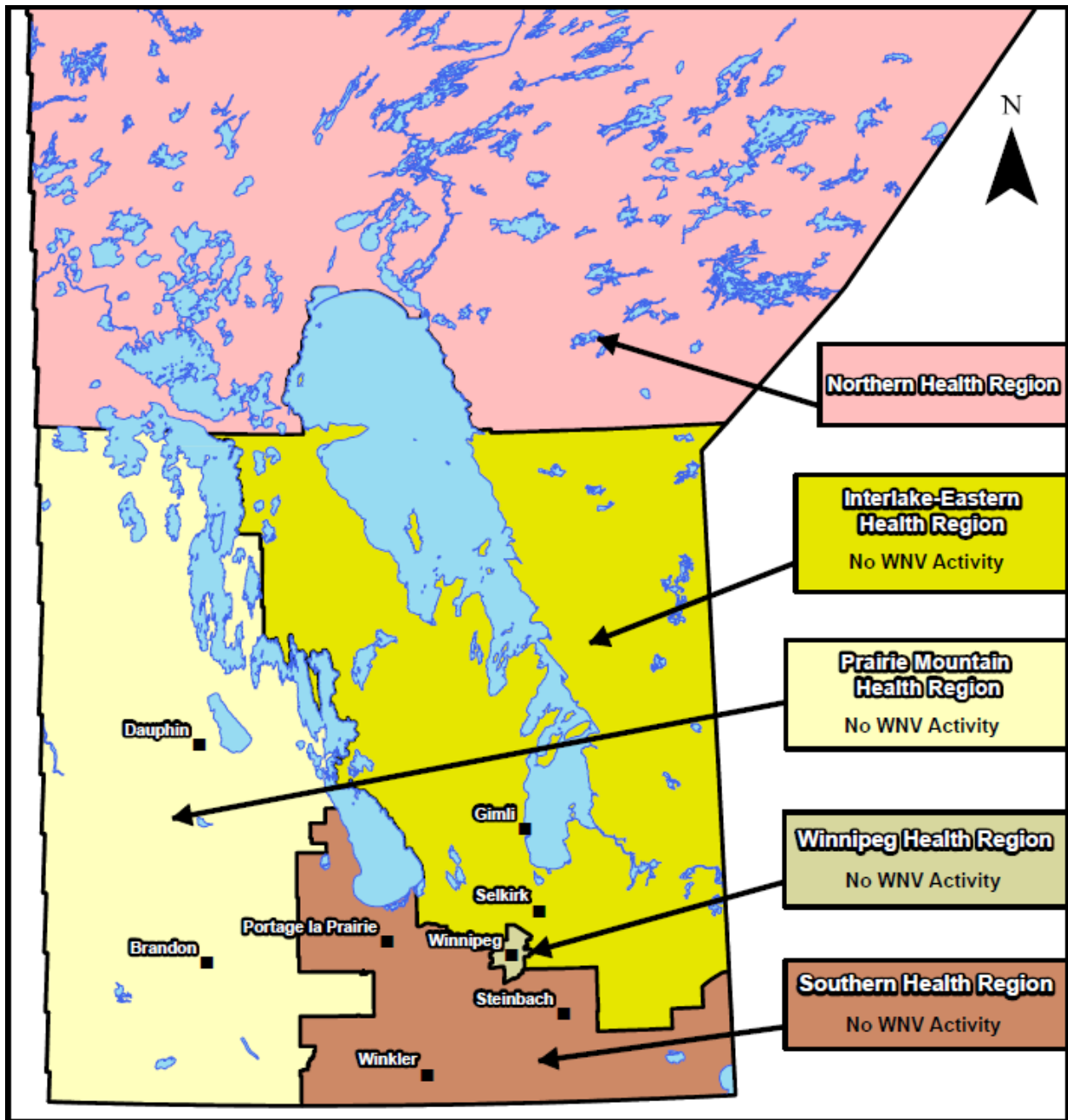


Figure 1 – WNV activity by Health Region within Manitoba (current to Week 24).

Table 2 – Average number and proportion of *Culex tarsalis* mosquitoes collected by surveillance community* in southern Manitoba – three week trend (current to Week 24).

Health Region	Community	Week 24		Week 23	
		Avg # of <i>Cx. tarsalis</i>	Proportion of <i>Cx. tarsalis</i>	Avg # of <i>Cx. tarsalis</i>	Proportion of <i>Cx. tarsalis</i>
Interlake-Eastern	Beausejour	0.25	1.72	0.67	0.67
	Gimli	4.00	8.70	0.33	0.33
	Oakbank	1.00	1.89	0.00	0.00
	Selkirk	0.33	9.09	0.00	0.00
	Stonewall	7.00	4.98	1.67	45.45
Prairie Mountain	Boissevain	3.25	9.29	0.50	2.86
	Brandon	3.30	11.30	1.50	24.19
	Carberry	0.50	3.33	0.00	0.00
	Dauphin	0.25	0.26	0.00	0.00
	Killarney	7.50	38.46	0.67	5.13
	Minnedosa	0.00	0.00	0.25	2.50
	Sioux Valley FN	8.00	3.31	No Trapping	No Trapping
	Souris	2.00	2.55	1.75	1.75
	Virден	1.50	0.72	0.00	0.00
Southern	Altona	13.75	35.26	5.00	22.22
	Carman	5.75	22.55	0.00	0.00
	Headingley	0.50	3.85	0.00	0.00
	Morden	11.00	18.11	4.00	8.99
	Morris	1.50	15.00	0.00	0.00
	Niverville	8.50	32.69	0.33	1.96
	Portage la Prairie	8.75	37.23	0.00	0.00
	Roseau River FN	7.00	48.28	0.00	0.00
	Ste. Anne	0.75	3.88	0.00	0.00
	Sandy Bay FN	4.75	0.94	0.00	0.00
	Steinbach	2.25	56.25	0.00	0.00
	Winkler	7.50	18.99	2.50	13.89
Winnipeg	East St Paul	0.00	0.00	1.50	1.50
	West St Paul	0.00	0.00	0.00	0.00
	Winnipeg	4.28	23.26	0.80	0.80
	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.

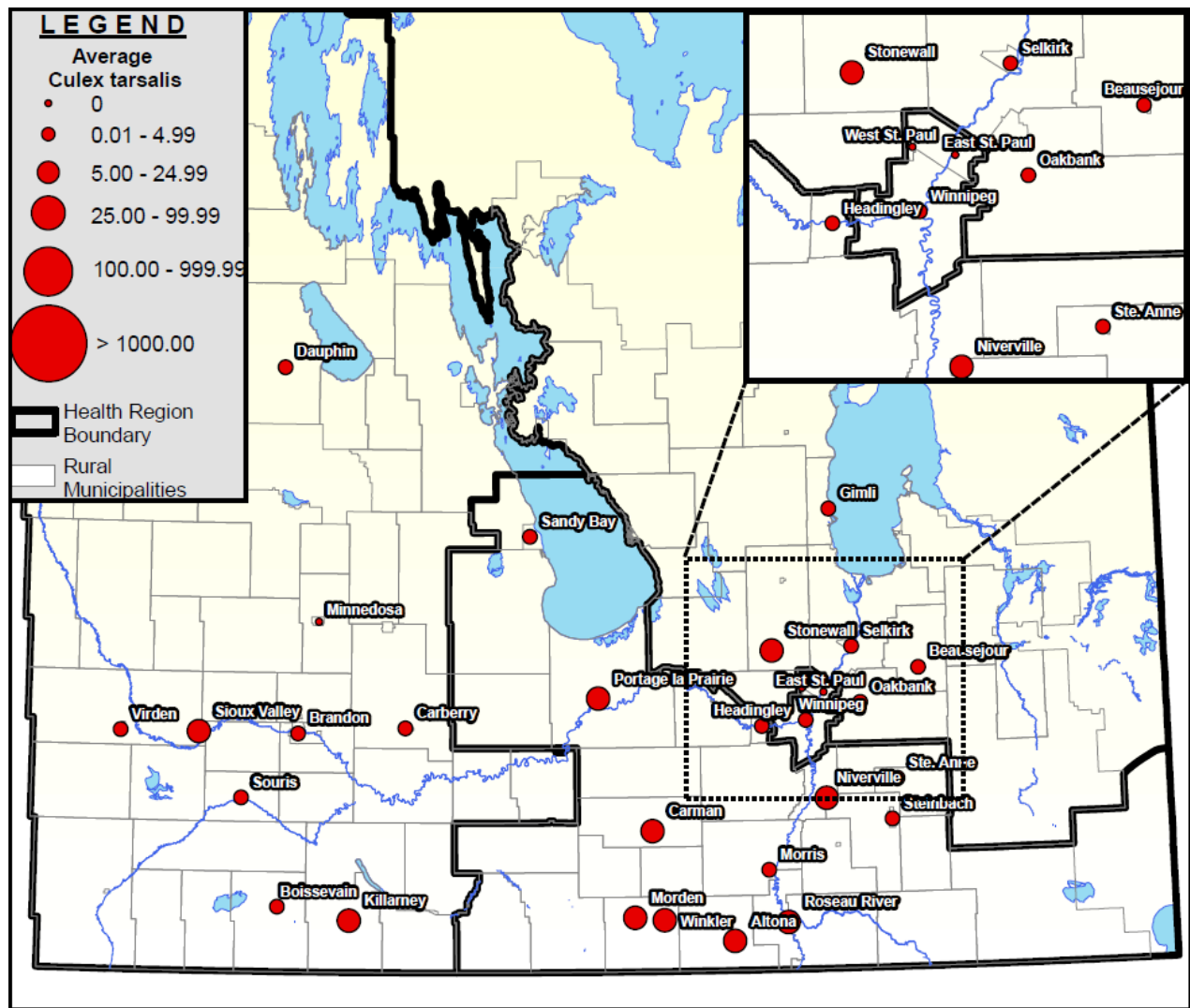
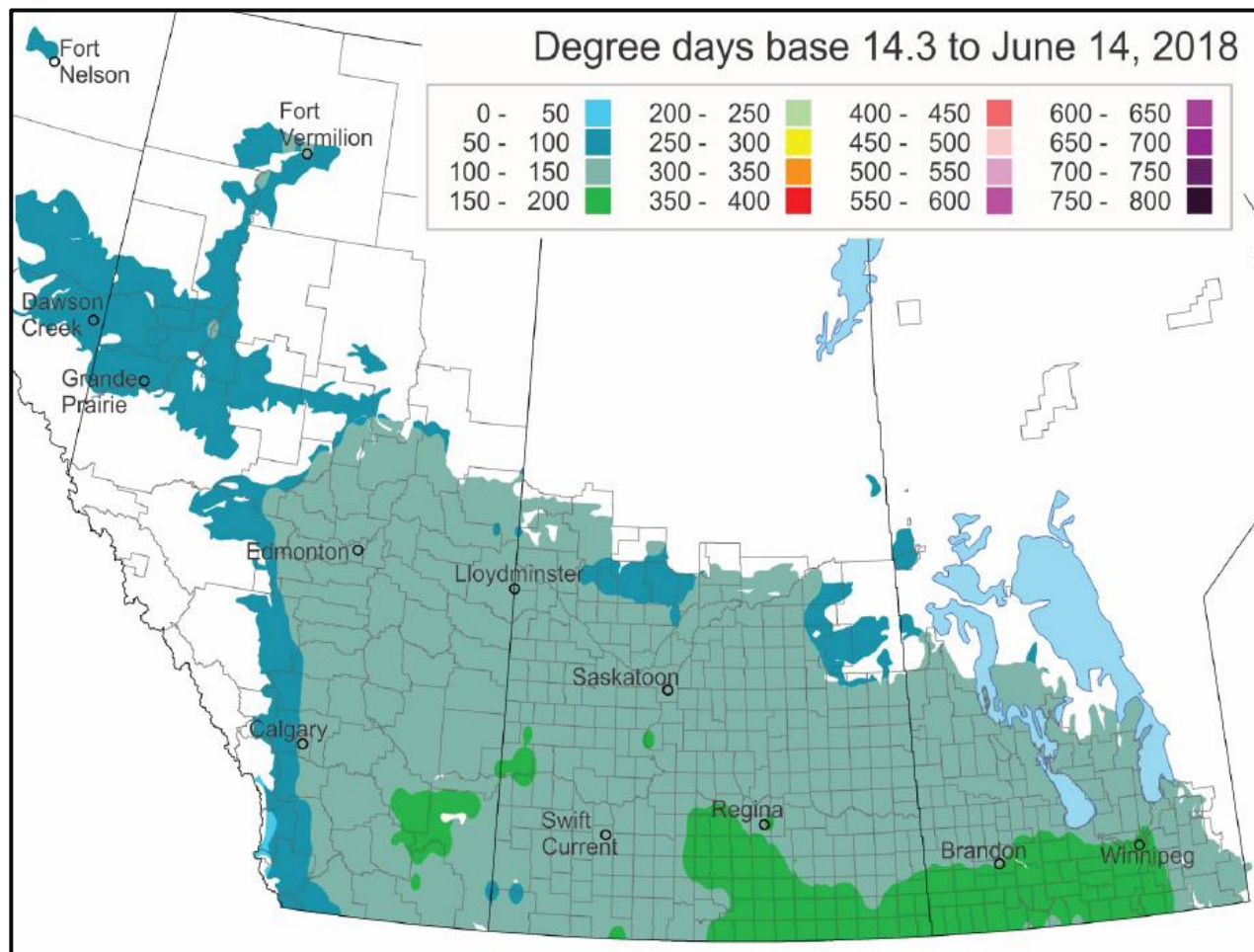


Figure 2 – Average number of *Culex tarsalis* mosquitoes collected across southern Manitoba during Week 24.



Source: Map produced courtesy of Agriculture and Agri-Food Canada's Prairie Pest Monitoring Network.

Figure 3 - Degree day accumulations, as of Week 24, across the Prairie Provinces.

Table 3 – Total number of human WNV cases*, by Health Region of residence, reported to Manitoba Health, Seniors and Active Living by laboratories (current to Week 24).

Health Region	CDC Week										Totals
	21	22	23	24	25	26	27	28	29	30	
Interlake-Eastern	0	0	0	0							0
Prairie Mountain	0	0	0	0							0
Southern	0	0	0	0							0
Winnipeg	0	0	0	0							0
Totals	0	0	0	0							0

* Note that cases are presented by week reported to MHSAL, 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 2016 season by health region (current to Week 24)

RHA	CDC Week										Totals
	21	22	23	24	25	26	27	28	29	30	
Interlake-Eastern	0	0	5	7							12
Prairie Mountain	0	0	12	29							41
Southern	0	0	11	33							44
Winnipeg	0	15	11	20							46
Weekly Totals	0	15	39	89							143

Table 5* – Total number and percentage of WNV positive *Culex tarsalis* mosquito pools by Health Region (current to Week 24)

Health Region	CDC Week										Totals
	21	22	23	24	25	26	27	28	29		
Interlake-Eastern	0 (0)	0 (0)	0 (0)	0 (0)							0 (0)
Prairie Mountain	0 (0)	0 (0)	0 (0)	0 (0)							0 (0)
Southern	0 (0)	0 (0)	0 (0)	0 (0)							0 (0)
Winnipeg	0 (0)	0 (0)	0 (0)	0 (0)							0 (0)
Weekly Totals	0 (0)	0 (0)	0 (0)	0 (0)							0 (0)

* 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 24)

Year	Cumulative (Year-to-Date) Amount		Year End Totals	
	Positive Mosquito Pools	Human WNV Cases	Positive Mosquito Pools	Human WNV Cases
2018	0	0	TBD	TBD
2017	0	0	41	5
2016	0	0	39	24
2015	0	0	30	5
2014	0	0	24	5
2013	0	0	19	3
2012	0	0	116	39
2011	0	0	0	0
2010	0	0	20	0
2009	0	0	2	2
2008	0	0	41	12
2007	23	3	948	587
2006	1	0	171	51
2005	0	1	193	58
2004	0	0	57	3
2003	0	0	290	143

WNV Activity in Canada and the United States

Canada:

- As of Week 24 there has been no WNV activity reported in Canada.
- Additional Canadian WNV information can be obtained by consulting the Public Health Agency of Canada West Nile virus website at <https://www.canada.ca/en/public-health/services/diseases/west-nile-virus/surveillance-west-nile-virus.html>, or by consulting the respective provincial department websites.

United States:

- As of June 18, 2018 WNV activity (i.e. human cases, positive mosquito pools, horse cases, etc) has been reported in a handful of states, including in South Dakota and North Dakota which recently announced their first WNV human case of the season. North Dakota has also detected its first WNV positive mosquito pool.

- Up to date U.S. WNV information can be obtained by visiting the United States Centers for Disease Control and Prevention – West Nile virus Website' at <http://www.cdc.gov/westnile/statsmaps/preliminarymapsdata/histatedate.html>, or by consulting state specific Public Health websites.

Appendix 1

Table 8 – 2018 CDC surveillance weeks

CDC Week Number	Dates	CDC Week Number	Dates
21	May 20 – May 26	30	July 22 - July 28
22	May 27 – June 2	31	July 29 - August 4
23	June 3 - June 9	32	August 5 - August 11
24	June 10 - June 16	33	August 12 - August 18
25	June 17 - June 23	34	August 19 - August 25
26	June 24 – June 30	35	August 26 - September 1
27	July 1 - July 7	36	September 2 - September 8
28	July 8 - July 14	37	September 9 - September 15
29	July 15 - July 21	38	September 16 - September 22

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.