

Saskatchewan West Nile & Culex Report

No. 3, July 19, 2013



Culex tarsalis Continuing to Emerge in Southern Saskatchewan

Most areas in southern Saskatchewan received rain this past week and some intense storms in southeastern areas spawned tornadoes, hail, damaging winds and caused localized flooding. This has kept some mosquito habitat with enough water for larvae to complete their development and emerge as adults. It was somewhat drier in west central parts of the province. Overnight temperatures have been cool in southern locations leading to lower mosquito catches on some of the nights. However, numbers of nuisance mosquito species such as *Aedes vexans* remain stubbornly high in some areas with numbers as high as 1,992/night in individual traps. Accumulated degree-day heat unitsⁱ continue to be at normal to slightly below-normal levels and remain behind levels seen in 2012 (Figs. 2 & 3). Winnipeg and the south central region of Manitoba have accumulated the most heat units in the prairies in 2013.

Numbers of the 2nd generation of *Culex tarsalis* continue to emerge in several communities in southern Saskatchewan. Southeastern areas have accumulated the most heat units in 2013 and *Culex tarsalis* development is the most advanced (Fig. 1). Numbers will continue to rise in other parts of southern Manitoba as the 2nd generation emerges in these areas as well. The average number of *Culex tarsalis* for the week ending July 13 (week 28)ⁱⁱ (July 7 – 13) is shown 12.48/night in the southern mixed-grass prairie eco-region and 1.89/night in the more central moist-mixed grass prairie eco-region (Table 1). Average numbers in individual traps range from 1 – 159/night. Preliminary numbers from week 29 (July 14 – 20) show leveling off or slight decline in numbers due to the cooler night-time temperatures, with some individual traps recording as high as 154/night.

Culex tarsalis averages for the four largest cities in Saskatchewan for week 28 (July 7-13) are: Saskatoon (2.86/night), Regina (0.3/night), Moose Jaw (6.5/night) and Prince Albert (0/night). Numbers are trending lower for week 29 (July 14-20) with Saskatoon (0/night), Regina (0.5/night), Moose Jaw (0.6/night) and Prince Albert (not available).

Table 1 – Average number of *Culex tarsalis* mosquitoes captured by eco-region

2013 Average Numbers of <i>Culex tarsalis</i> Per Night by Eco-region					
Eco-Region					
Surveillance Week (Ending on date listed)	Mixed-Grass Prairie (Sun Country, Regina Qu'Appelle, Five Hills, Cypress, Heartland Health Regions)	Moist Mixed-Grass Prairie (Sunrise, Saskatoon, Prairie North Health Regions)	Boreal Transition (Prince Albert Parkland, Kelsey Trail Health Regions)	Boreal Forest (Mamawetan Churchill River, Keewatin Yatthé Health Regions)	Ave. (For week)
23 (June 2-8)	0	0	-	-	0
24 (June 9-15)	0	0	-	-	0
25 (June 16-22)	0.42	0.04	-	-	0.26

26 (June 23-29)	1.44	0.13	0	-	0.90
27 (Jun 30-Jul 6)	4.99	0.3	0	-	3.44
28(Jul 7-13)	12.48	1.89	0	-	8.08
Average	3.22	0.39	0	-	

Averages are determined by dividing the total number of *Culex tarsalis* mosquitoes caught divided by the total number of trapping nights.

There has been one (1) positive mosquito poolⁱⁱⁱ detected in southern Saskatchewan from week 28 (July 7-13). There have been no positive horses or humans reported from Saskatchewan in 2013.

There has been one (1) positive mosquito pool (from week 28 July 7-13) from south central Manitoba. There have been two (2) positive pools from Minnesota, and 24 positive pools from South Dakota. Minnesota has two (2) positive birds and North Dakota one (1) positive bird. The only confirmed illness in humans to date has been the four (4) cases reported from South Dakota.

West Nile Virus Risk

The detection of the first positive mosquito pool last week in southern Saskatchewan is the first evidence that WNV is present and beginning to cycle in birds and mosquitoes. *Culex tarsalis* activity and development has slowed somewhat with the stormy, windy weather and cooler night-time temperatures this past week. However, with a return to warm, humid conditions we expect to see more positive mosquito pools, rising infection rates and with it an increasing WNV risk of virus transmission to people. Conditions continue to be optimal for the development of *Culex tarsalis* throughout all of south and central Saskatchewan, but are the most advanced in southeastern regions (Figure 1). If the pattern observed in other years continues, we should expect to see 2nd generation *Culex tarsalis* numbers reach their peak over the next two weeks.

Parts of southern Manitoba and southeastern Saskatchewan have accumulated the most degree-day heat units^{iv} in the prairie region, although levels continue to be lower than those experienced in 2012 (Figs. 1 & 2).

Figure 1: Degree Day Accumulations – Prairie Provinces (July 17, 2013)

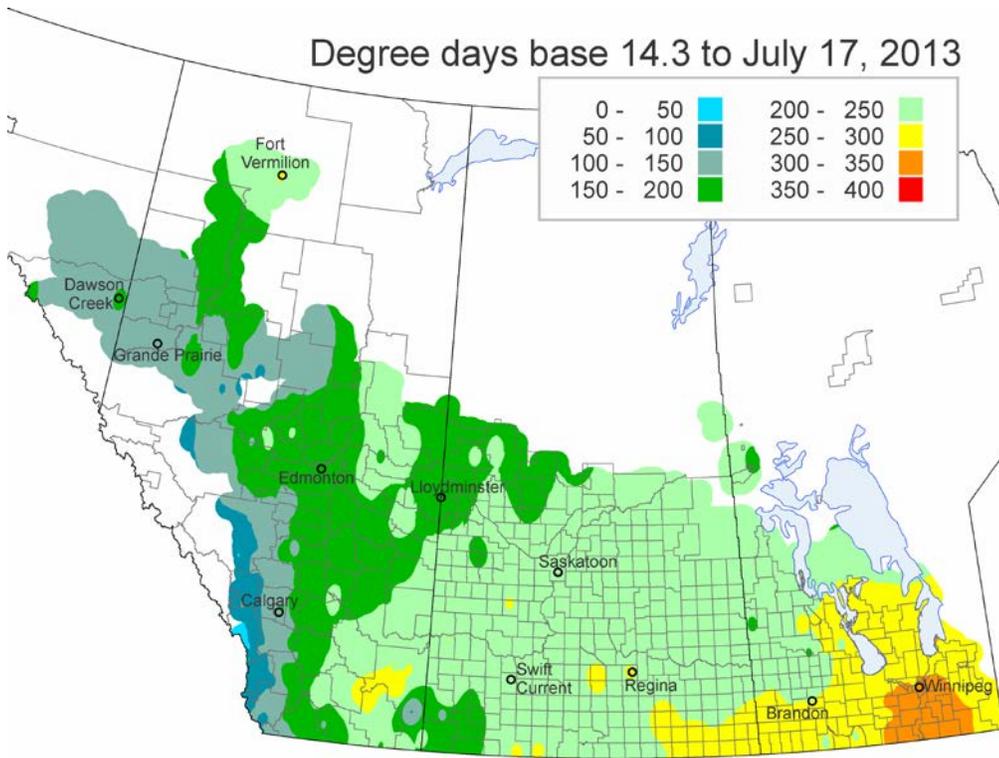
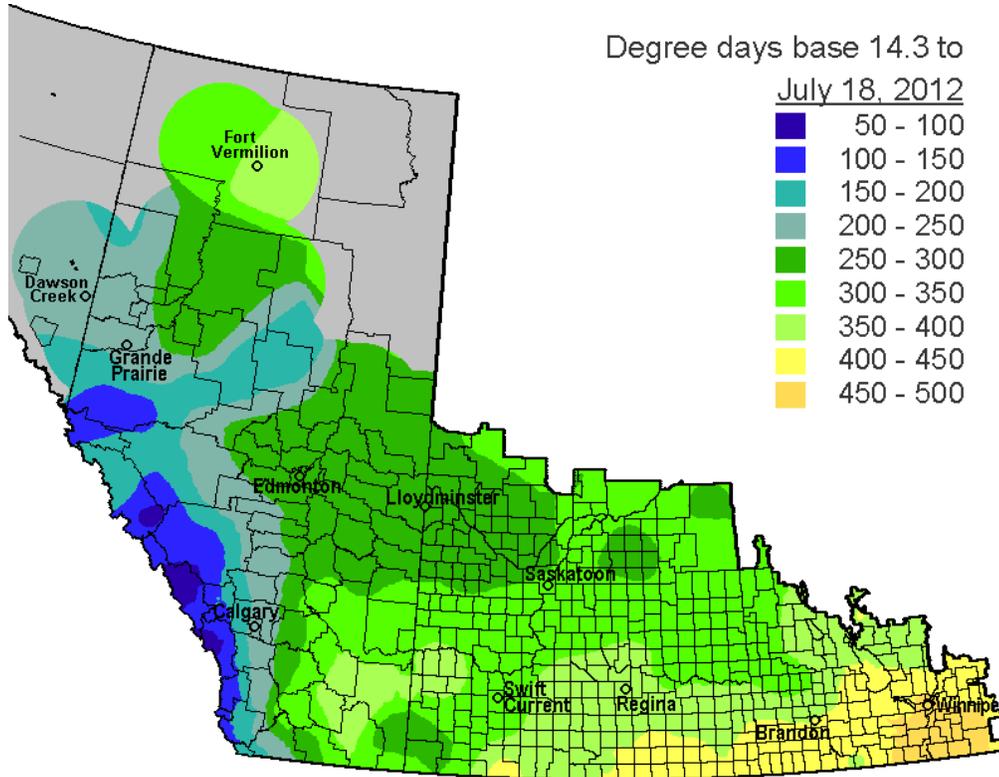


Figure 2: Degree Day Accumulations – Prairie Provinces (July 18, 2012)



(Maps courtesy of Agriculture and Agri-food Canada)

Find more West Nile information and current risk levels online: www.health.gov.sk.ca/west-nile-virus

ⁱ **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 favourable.

Surveillance weeks - A surveillance week runs for the calendar year from Sunday to Saturday, with each week being numbered from one to 52. In 2013, week one was from Dec. 30, 2012 to Jan. 5, 2013

Week Number	Dates	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

ⁱⁱⁱ **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* mosquitoes (including *Culex tarsalis*, *Culex restuans* and *Culex territans*) collected from one trap on a given night are placed in pools of 1 – 50 mosquitoes for WNV testing. Occasionally other species, most notably *Culiseta inornata*, are placed in pools and tested as well. When more than 50 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 mosquitoes collected from a given trap.

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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. This is called the “Extrinsic Incubation Period”. The risk of transmission increases with increasing Degree Day accumulation. Moreover, consistently warmer temperatures will significantly shorten the extrinsic incubation period thereby increasing the potential risk of WNV transmission – should the virus itself be present and other conditions prove to be favourable.