

Adult Mosquito Surveillance

Adult Mosquito Surveillance Highlights for 2005

- 90,769 female adult mosquitoes were collected and separated into species in Peel Region, a 70% increase over the number collected in 2004
- 42 different mosquito species were found in the Region of Peel
 - *Coquillettidia perturbans* and *Aedes vexans* were the most common species, 38 and 26%, respectively
- 4.7% of all mosquitoes collected were *Culex* species
- A total of 30 permanent traps were set in Peel Region (Mississauga – 16; Brampton – 9; Caledon – 5)
- 13 traps contained positive mosquitoes in 2005
 - 7 traps had positive mosquitoes only once
 - one trap had positive mosquitoes more than 5 times
- There was a 500% increase, from 4 to 24, in positive pools when compared to 2004
 - All positive pools were due to *Culex* species (70.8% *Culex pipiens*, 16.7% *Culex pipiens/restuans* and 12.6% *Culex restuans*)
- The first positive batch was reported on July 7, 2005 in Mississauga
- Peel Region had the third highest number of positive mosquito pools in the province. Only the City of Toronto and Windsor-Essex had more with 142 and 30 positive pools, respectively.
- Nationally, five provinces reported positive mosquitoes – Ontario had the greatest number, 291, followed by Manitoba with 193
- In the Great Lake States, Illinois reported the most positive pools with 2,498
- The Asian Tiger mosquito (*Stegomyia albopicta*), a vector for a number of viruses including WNV, was found in Peel Region and two other Ontario health unit regions in 2005.

West Nile Virus (WNV) circulates between mosquitoes and birds when a female mosquito feeds on the blood of a WNV-infected bird. Once the virus has incubated in the mosquito, it can be passed to another host through the saliva of the mosquito. Mosquito surveillance programs serve to monitor the mosquito population both for their size and species. Certain species are associated with WNV transmission to humans. It is therefore important to monitor their occurrence in order to assess the potential human health risk. In 2005, the species of particular interest due to their WNV transmission risk continued to be the *Culex* species. This year was also the first year that the Asian Tiger mosquito (*Stegomyia albopicta*) was identified in Peel.



Figure 11 CDC Light Trap
(Source: Region of Peel, 2005)

In 2005, Peel Public Health used two types of mosquito traps. The majority of the traps were the Center for Disease Control (CDC) light trap. These traps were placed in a fixed location throughout the surveillance season. This type of trap uses light and carbon dioxide to attract adult female mosquitoes that are looking for a blood meal. The second type of trap, the gravid trap, was also used at a Brampton location after collection of the Asian Tiger mosquito. In the gravid trap a nutrient-rich infusion media is used to attract gravid female mosquitoes searching for a suitable site in which to lay their eggs. The Asian Tiger mosquito is discussed in greater detail at the end of this chapter.

Adult mosquitoes were collected once weekly from the fixed location trapping sites. The mosquitoes were packed on dry ice and sent by courier to GDG Environment Ltd. (GDG) in Trois-Rivières, Québec.

Upon receipt, taxonomists sorted the specimens by removing other insects and male mosquitoes and then identified the remaining female mosquitoes at the species level. If specimens were unidentifiable due to their condition, they were placed at the highest levels possible (group, genus and in extreme cases, family).

The mosquitoes were grouped into pools of approximately 50 individual mosquitoes and placed in air tight vials each containing one species or species group. The number of gravid females present was recorded for each pool. When the trap contained more than 500 female mosquitoes, a subsample was extracted and processed. Enriched subsampling was also done which involved removing all visible specimens of *Culex pipiens* and *Culex restuans* in the unprocessed portion of the trap contents and adding these to the processed portion of the trap contents. The unprocessed portion of the trap contents were preserved for possible subsequent research¹⁶.

While there was an attempt to identify all species in a given pool, particular attention was placed to identifying and testing those mosquito species that have been confirmed to be carriers of WNV in Ontario and in North America. The species tested for WNV were prioritized based on a number of factors including species, vector potential, abundance, population density, risk of humans being bitten and past WNV activity (Table 11).

Once separated into species-specific pools of no more than 50 mosquitoes, the samples were tested for WNV. GDG Environment Ltd. tested the pools according to the standards proposed by the Health Canada Special Pathogens Branch of the National Microbiology Laboratory. The method used to detect WNV is called reverse transcription polymerase chain reaction (RT-PCR)¹⁶.

Table 12 presents the estimated number of mosquitoes collected by species. These estimates are based partially on actual counts, where the pool size was less the 50 mosquitoes and partially on estimating methods when the pool sizes exceeded 50 mosquitoes¹⁶. Almost 91,000 mosquitoes were collected and identified by species. This represents a 70% increase in the total number of mosquitoes collected over 2004 when 53,556 mosquitoes were collected. In 2004, the same number of permanent traps was deployed whereas there were fewer traps being deployed in years 2001 to 2003.

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Forty-two different species were identified in Peel in 2005¹⁶. Less than one per cent of the mosquitoes were unclassifiable and were placed in an “other species” grouping. In addition, approximately 3.5% of the mosquitoes were grouped in a damaged category because they were not whole mosquitoes and were therefore “unidentifiable”.

Table 11 Mosquito Species Tested for ENV in Order of Priority - Region of Peel, 2005

Priority	Species
1	<i>C. pipiens</i>
2	<i>C. restuans</i>
3	<i>C. pipiens/C. restuans</i>
4	<i>Ae. Vexans vexans</i>
5	<i>C. salinarius</i>
6	<i>Cq. perturbans</i>
7	<i>Och. trivittatus</i>
8	<i>An. punctipennis</i>
9	<i>Och. triseriatus</i>
10	<i>An. walkeri</i>
11	<i>Ae. vexans nipponi</i>
12	<i>Och. stimulans</i>
13	<i>An. quadrimaculatus</i>
14	<i>Och. sollicitans</i>
15	<i>Och. japonicus</i>
16	<i>Cx. tarsalis</i>
17	<i>S. albopicta</i>

Source: GDG, 2005

Coquillettidia perturbans and *Aedes vexans* were the most common mosquito species collected representing 38% and 26% of the total mosquitoes collected. This finding is consistent with the species prevalence in previous years.

Of the total number of mosquitoes collected, most of them were collected in the City of Mississauga (57%), followed by the City of Brampton (32%) and the Town of Caledon (11%). This is consistent with the distribution in 2004 where 59, 28 and 13% were collected from Mississauga, Brampton and Caledon, respectively. However, the species distribution across the municipalities varied. For example, the most common mosquito, *Coquillettidia perturbans*, was 15 and 12 times more abundant in the City of Mississauga than in Brampton and Caledon, respectively. However, *Aedes vexans*, the second most common mosquito, was only 1.1 times more abundant in the City of Mississauga than in Brampton.

Table 12 Estimated Number of Female Adult Mosquitoes Collected and Identified by Species - Region of Peel, 2005

Species	Brampton	Caledon	Mississauga	Peel	% of Total
<i>Coquillettidia perturbans</i>	2020	2456	30296	34772	38
<i>Aedes vexans vexans</i>	10670	1177	11337	23184	26
<i>Ochlerotatus Broad-banded</i>	3293	4160	1769	9222	10
<i>Ochlerotatus canadensis</i>	4090	493	50	4633	5
<i>Ochlerotatus trivittatus</i>	3362	54	585	4001	4
<i>Aedes/ochlerotatus spp.</i>	1696	629	1300	3625	4
<i>Culex pipiens</i>	1247	70	1475	2792	3
<i>Culex pipiens/restuans</i>	323	56	742	1121	1
<i>Ochlerotatus black-legged</i>	634	24	164	822	1
<i>Anopheles punctipennis</i>	306	134	380	820	1
<i>Ochlerotatus triseriatus/hendersoni</i>	116	49	611	776	1
<i>Aedes cinereus</i>	260	155	91	506	0.6
<i>Ochlerotatus triseriatus</i>	94	17	262	373	0.4
<i>Anopheles quadrimaculatus</i>	198	102	25	325	0.4
<i>Culex restuans</i>	102	17	155	274	0.3
<i>Anopheles spp.</i>	58	45	12	115	0.1
<i>Culex species</i>	32	2	54	88	0.1
<i>Ochlerotatus japonicus</i>	2	2	79	83	0.1
<i>Other spp.</i> [§]	7	1	15	23	0.03
<i>Ochlerotatus provocans</i>	2	9		11	0.01
<i>Anopheles walkeri</i>	10			10	0.01
<i>Culiseta morsitans</i>	4	2		6	0.01
<i>Culex salinarius</i>	1			1	0.001
<i>Stegomyia albopicta</i>	1			1	0.001
<i>Damaged</i> [*]	864	305	2016	3185	3.5
Total Mosquitoes	29391	9959	51417	90769	100⁺

* this group includes unidentifiable mosquitoes

⁺ does not equal 100 due to rounding

[§]This table only identifies 24 different species. However, a total of forty-two were identified in 2005. The other species were captured in “Other spp”

WNV vector mosquitoes of particular interest for Ontario highlighted in blue

Map 9 shows the fixed location for the CDC light traps in the Region of Peel for 2005. There were a total of 30 fixed location traps: 16 in the City of Mississauga, nine in the City of Brampton and five in the Town of Caledon. The traps are distributed by Regional ward where

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there is a minimum of one trap per ward. Of the thirty traps, 13 contained positive mosquitoes in 2005. Seven traps were positive only once and one trap went positive more than 5 times¹⁶.

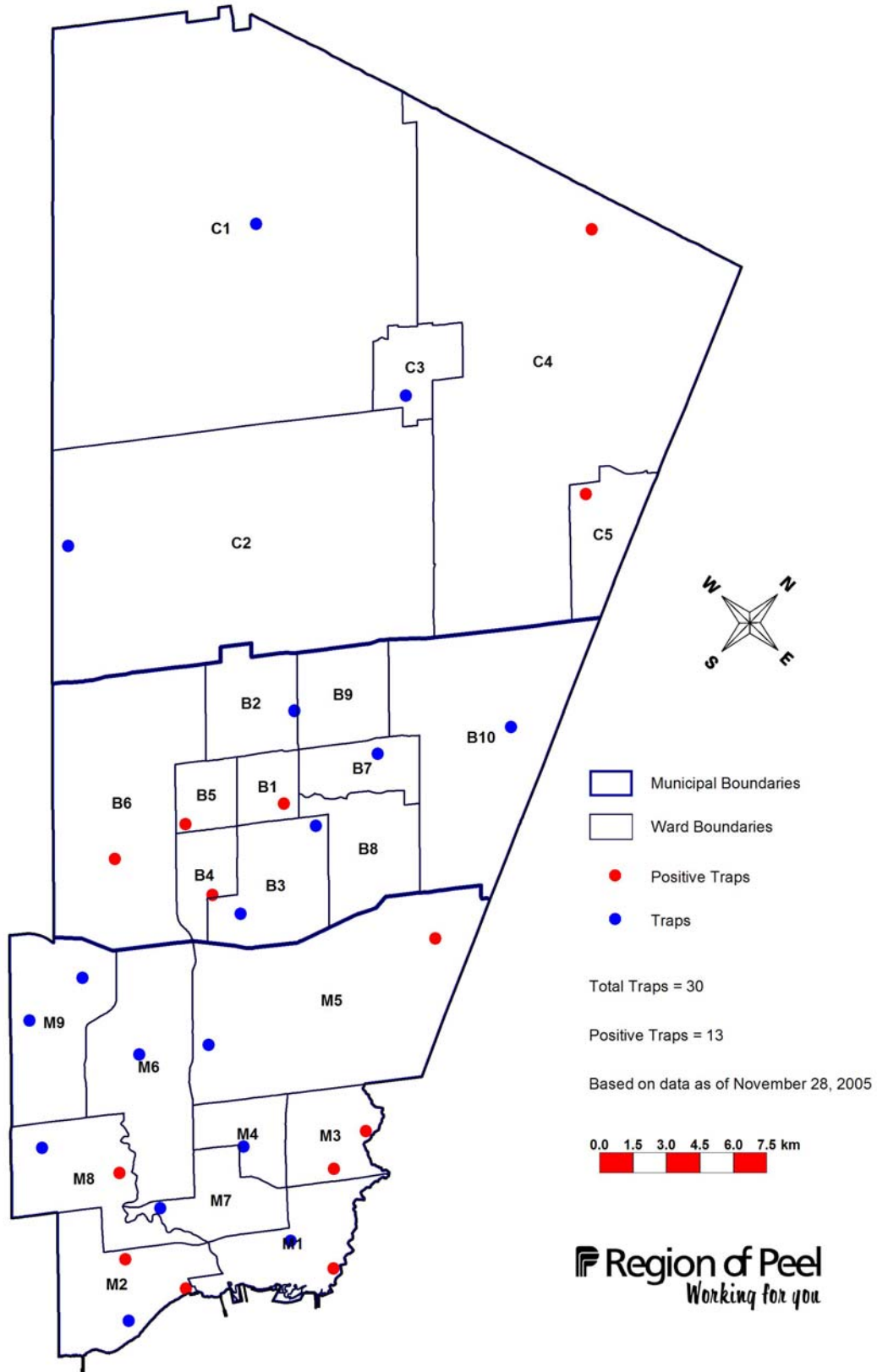
Upon notification of a positive mosquito batch, seasonal staff in the WNV program went door-to-door in the immediate area advising residents of the positive batch and offering to survey the property for mosquito breeding sites. In addition, educational material on symptoms of WNV, reduction of mosquito breeding sites and personal protection were provided to the residents. An intensified environmental scan around the area of the identified positive batch was conducted to verify that roadside catch basins were treated and identify stagnant water sites. Any mosquito breeding sites identified were larvicided or remediated.

Table 13 presents the number of WNV-positive mosquito trapping events since 2001 by municipalities. In 2005, there were 24 separate events where a mosquito trap tested positive. Each municipality had positive mosquito trapping events; however, the majority of the positive trapping events occurred in Mississauga numbering at 16 compared to six in the City of Brampton and two in the Town of Caledon. The first positive trapping in 2005 event was reported on July 7 in Mississauga. The year 2005 marked the first year that the Town of Caledon reported positive mosquitoes.

Table 13 Number of Positive Trapping Events - Region of Peel, 2001-2005

Year	Region of Peel	Mississauga	Brampton	Caledon	Date of First Positive
2001	4	4	0	0	August 31, 2001
2002	128	106	22	0	June 20, 2002
2003	24	16	8	0	July 24, 2003
2004	4	2	2	0	July 15, 2004
2005	24	16	6	2	July 7, 2005

Map 9 Location of Mosquito Traps by Municipal Ward ,
Region of Peel, 2005



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In 2005, a significant increase in the number of positive trapping events was observed when compared to 2004 – from 4 to 24 representing a 500% increase. However, 2005 compared well to 2003 when there were also 24 positive trapping events and remained significantly lower than the overall high of 128 positive trapping events seen in 2002. There was consistency with previous years in that the City of Mississauga had the highest number of traps positive for WNV and the greatest number of positive trapping events. This mirrors the finding that the greatest percentage of mosquitoes was collected from traps located in the City of Mississauga.

Figure 12 illustrates the temporal occurrence of WNV positive mosquito traps throughout the season by municipality. The first positive trap was reported on July 7, 2005. While the July timeframe of the first positive trapping event was generally consistent with previous years the one notable difference is that 2005 was the first year that WNV positive mosquitoes preceded the first report of WNV positive bird in the Region of Peel (July 24, 2005).

Figure 12 WNV Positive Mosquito Traps by Week of Collection and Municipality - Region of Peel, 2005

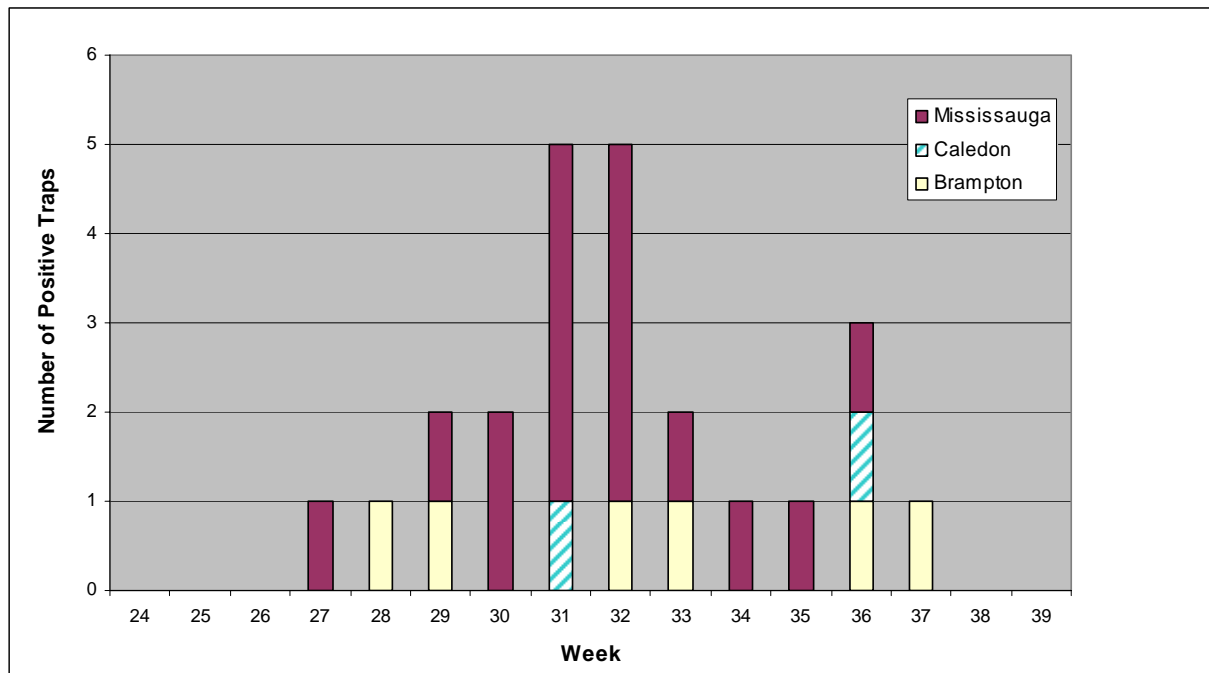
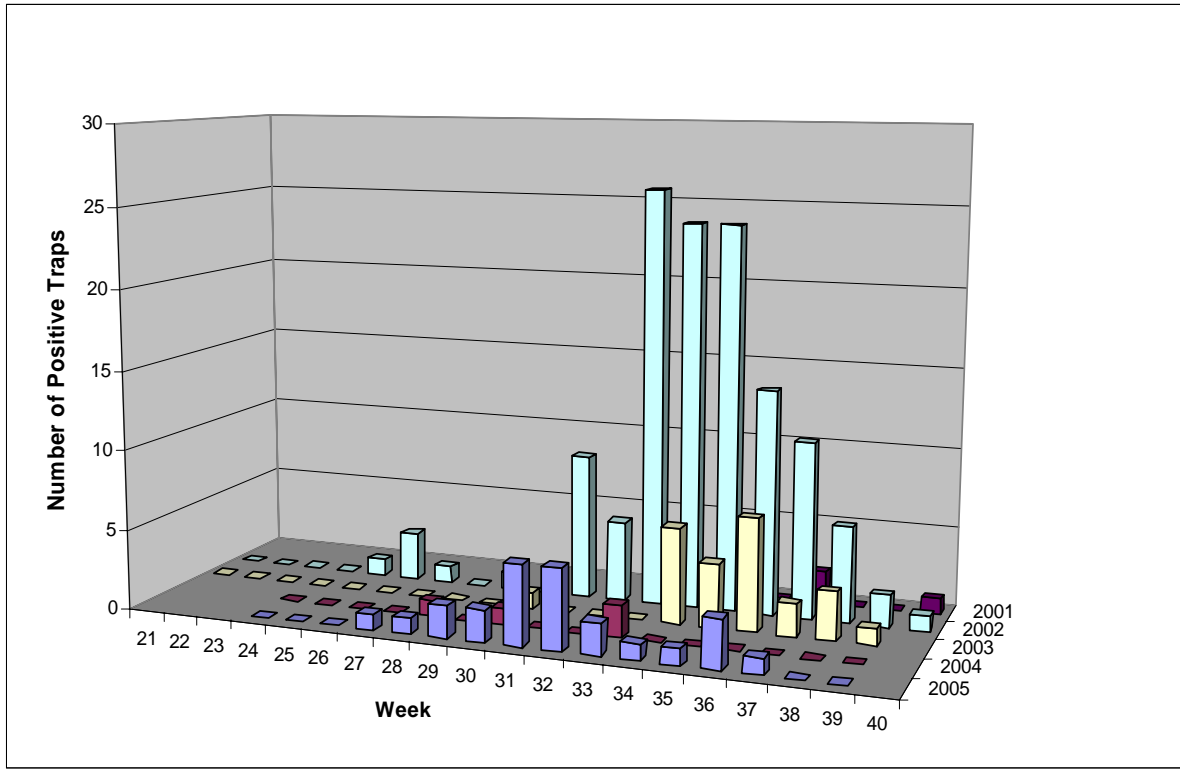


Figure 13 compares the total number of positive traps per week for 2002 through 2005. Based on previous years data, positive traps are likely to occur anytime after June (week 21). However, the onset and peak of WNV-positive traps vary from year to year. This is likely due to a range of factors including weather (temperature and rainfall) and the effectiveness of the multifaceted prevention program involving reduction of breeding sites on public and private property and larviciding catch basins.

Figure 13 WNV Positive Mosquito Traps by Week of Collection and Municipality - Region of Peel, 2001-2005



Culex spp. mosquitoes are of particular interest because they have been the predominant species positive for WNV in Peel Region. Table 14 presents the annual comparison of the number of female *Culex* mosquitoes. In 2005, the absolute number of female *Culex* mosquitoes was similar to 2004 but represented a lesser percentage of the total number of mosquitoes collected throughout the season. Approximately, 5% of the female mosquitoes collected were *Culex* species compared to 8% in 2004, 13% in 2003 and 30% in 2002. Nevertheless, in 2005 all the positive pools were associated with the *Culex* species - 70.8% *Culex pipiens*, 16.7% *Culex pipiens/restuans* and 12.6% *Culex restuans*. Historically, the *Culex* species has consistently been responsible for the majority of the WNV-positive mosquito pools. This finding confirms that the WNV prevention plan should continue to focus primarily on reducing the number of *Culex* mosquitoes and that the *Culex* species abundance should continue to be reviewed in the weekly WNV risk assessment.

Table 14 Annual Comparison of Female *Culex* Mosquitoes Collected and Positive Pools - Region of Peel, 2002-2005

Year	Female Mosquitoes Collected			Positive Mosquito Pools		
	Total Number	Number of <i>Culex</i>	% <i>Culex</i>	Total Number	Number of <i>Culex</i>	% <i>Culex</i>
2002 ¹	24,269	7,278	30.0	128	98	76.6
2003 ¹	41,212	5,326	12.9	24	23	95.8
2004 ¹	53,556	4,305	8.0	4	4	100.0
2005 ²	90,769	4,276	4.7	24	24	100.0

¹Source: Peel Public Health, 2004

²Source: GDG, 2005

Figure 14 illustrates the average number of *Culex* mosquitoes collected per trapping event for each week. The average number of *Culex* per trap peaked from week 28 through week 32, corresponding to mid-July to mid-August. During these weeks the number of *Culex* per trap exceeded 10 but stayed below 20. Even though the average number of *Culex* per trap during this period exceeded those found in 2004, the temporal pattern is consistent with the previous year. However, during this same period the average number of *Culex* per trap exceeded those seen in 2003, the year with the second highest number of *Culex* per trap. 2002 remains the benchmark year where the number of *Culex* per trap regularly exceeded 30 per trap and approached or exceeded 50 per trap on two occasions.

Figure 14 Average Number of *Culex* Species per Trap Event by Week - Region of Peel, Weeks 24-39, 2002-2005

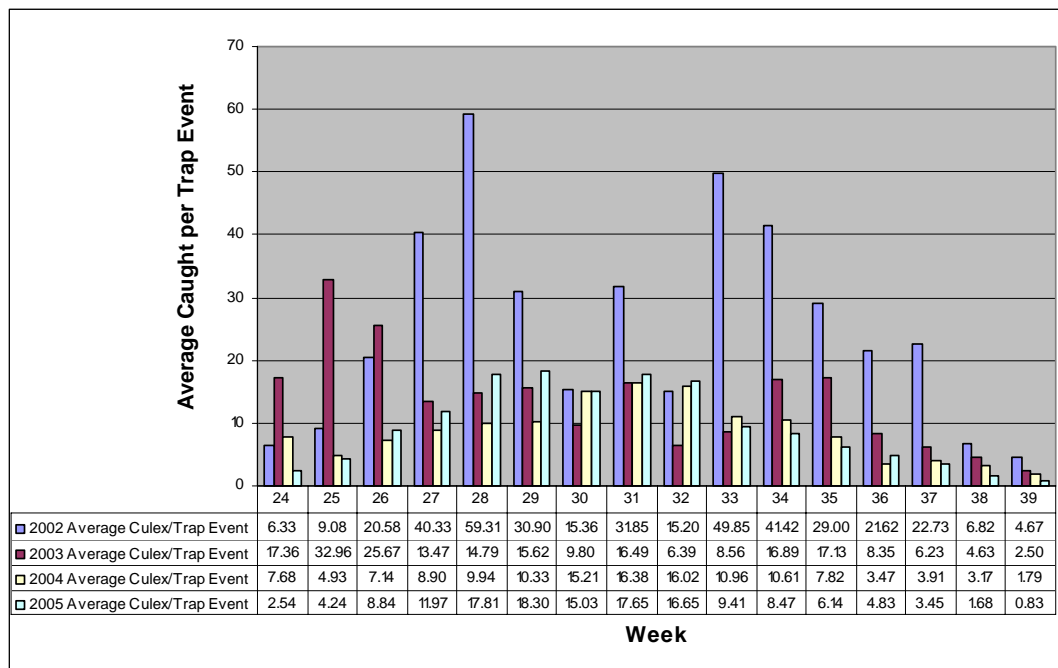


Figure 15 illustrates the weekly percentage of *Culex* species relative to the total number of mosquitoes present at 13 traps that were located at the same sites during the same time period in all years 2002 through 2005. The site count represents the number of traps included in a given weekly analysis. This value is not consistent throughout all weeks because some may not have been available for all weeks. The percentage of *Culex* relative to the total number of mosquitoes collected was lower than 2004 for most weeks except for weeks 29, 31 and 34. The number of *Culex* exceeded 5% of the total collected on five occasions and exceeded 10% only twice. This is much lower than the highs seen in 2002 when the percentage of *Culex* reached values greater than 70%.

Figure 15 Proportion of *Culex* Species to Total Species in Selected Sites - Region of Peel, 2002-2005

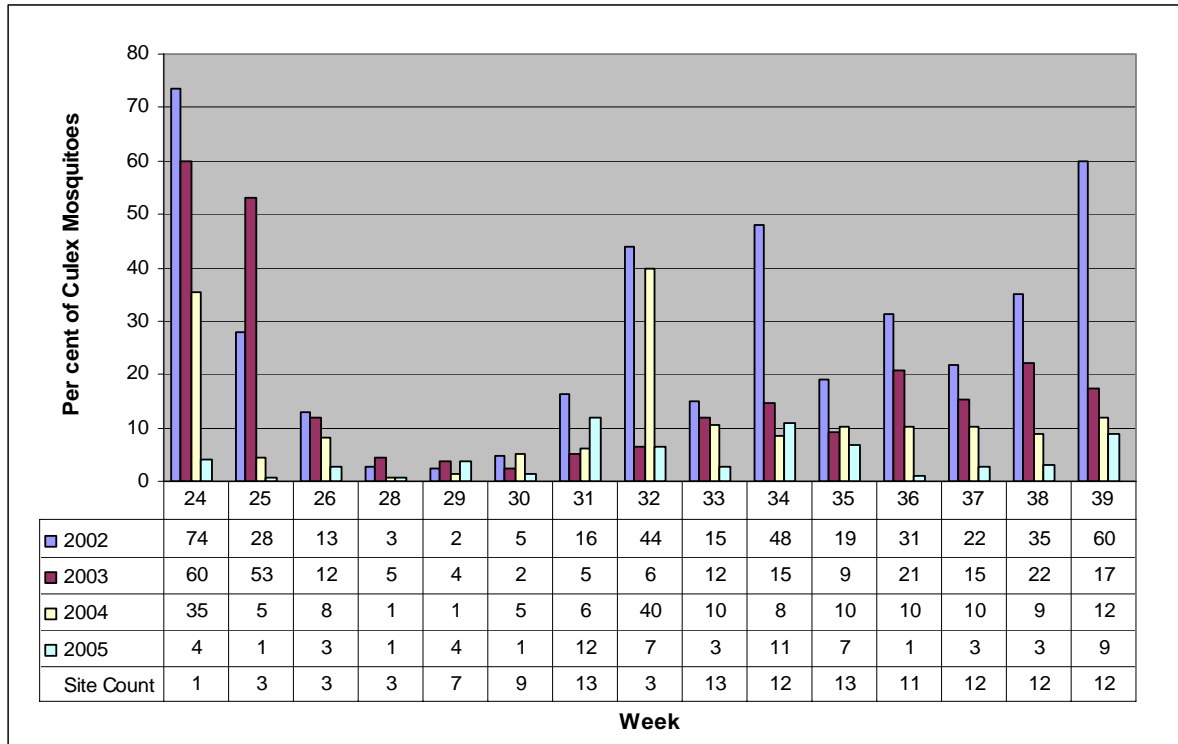


Table 15 compares the top 12 mosquito species collected at 13 traps that have been present across all years. *Coquillettidia perturbans* and *Aedes vexans* continue to rank first and second, respectively, as they have for all years prior to this year. This finding is consistent with the ranking for all 30 traps in the Region of Peel (Table 12). However, the percentage of *Coquillettidia perturbans* in these 13 common traps is greater (61%) than the prevalence across all traps (38%). The percentage of *Aedes vexans* in the common traps was similar to the percentage in all traps (24% versus 26%). In 2005, approximately 2% of mosquitoes collected in these common traps were the *Culex* species. This represents the lowest per cent of *Culex* mosquitoes in these common traps since 2002. There has been a steady decline every year, from 24.8% in 2002 to 8.7% in 2003, and 5.1% in 2004. In comparison, the per cent *Culex*

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Table 15 Annual Comparison of the Top 12 Mosquito Species Collected from Common Traps and Time Periods – Region of Peel, 2002-2005

2002				2003				2004				2005			
Rank	Species	Average Actual Number of Mosquitoes Collected	%	Rank	Species	Average Estimated Number of Mosquitoes Collected	%	Rank	Species	Average Estimated Number of Mosquitoes Collected	%	Rank	Species	Average Estimated Number of Mosquitoes Collected	%
1	<i>Cq. perturbans</i>	4147	38.8	1	<i>Cq. perturbans</i>	11991	58.0	1	<i>Cq. perturbans</i>	14608	66.4	1	<i>Cq. perturbans</i>	27302	61.8
2	<i>Ae. vexans</i>	2301	21.5	2	<i>Ae. vexans</i>	3646	17.6	2	<i>Ae. vexans vexans</i>	3708	16.8	2	<i>Ae. vexans vexans</i>	10741	24.3
3	<i>Cx. pipiens/restuans</i>	1173	11.0	3	<i>Oc. canadensis</i>	1423	6.9	3	<i>Oc. trivittatus</i>	756	3.4	3	<i>Oc. trivittatus</i>	2433	5.5
4	<i>Cx. spp.</i>	610	5.7	4	<i>Cx. pipiens/restuans</i>	1284	6.2	4	<i>Cx. pipiens/restuans</i>	709	3.2	4	<i>Cx. pipiens</i>	744	1.7
5	<i>Cx. pipiens</i>	604	5.7	5	<i>Ae. /Oc. spp.</i>	568	2.7	5	<i>Ae. /Oc. spp.</i>	529	2.4	5	<i>Ae. /Oc. spp.</i>	688	1.6
6	<i>Ae. vexans/cantator</i>	445	4.2	6	<i>Oc. trivittatus</i>	319	1.5	6	<i>Oc. canadensis</i>	453	2.1	6	<i>Oc. black legged</i>	632	1.4
7	<i>Ae./Oc. spp.</i>	319	3.0	7	<i>Oc. stimulans</i>	237	1.1	7	<i>Cx. pipiens</i>	286	1.3	7	<i>Oc. broad-banded</i>	506	1.1
8	<i>Cx. restuans</i>	257	2.4	8	<i>Cx. restuans</i>	216	1.0	8	<i>Oc. triseriatus</i>	269	1.2	8	<i>Cx. pipiens/restuans</i>	296	0.7
9	<i>Oc. excrucians</i>	177	1.7	9	<i>An. punctipennis</i>	195	0.9	9	<i>Oc. broad-banded</i>	187	0.8	9	<i>Ae. cinereus</i>	222	0.5
10	<i>Oc. trivittatus</i>	175	1.6	10	<i>Culex spp.</i>	169	0.8	10	<i>An. punctipennis</i>	147	0.7	10	<i>Oc. triseriatus/hendersoni</i>	161	0.4
11	<i>Oc. canadensis</i>	120	1.1	11	<i>Cx. pipiens</i>	147	0.7	11	<i>Cx. restuans</i>	126	0.6	11	<i>An. punctipennis</i>	156	0.4
12	<i>Oc. triseriatus</i>	93	0.9	12	<i>Ae. vexans/cantator</i>	98	0.5	12	<i>Oc. stimulans</i>	111	0.5	12	<i>Oc. triseriatus</i>	101	0.2

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collected in common traps (Table 15) was below the rate of 5% *Culex* species collected in all the traps in the Region of Peel in 2005 (Table 12).

As noted earlier in this chapter, the total number of *Culex* mosquitoes collected in 2005 did not vary much from the previous year. However, the average per cent of *Culex* in traps across the Region of Peel continues to decline. The decrease in *Culex* species may be attributed to a successful larviciding program targeted to eliminate the *Culex* species, and a reduction in breeding sites preferred by the *Culex* species.

Given that all the WNV-positive mosquito traps in 2005 were due to *Culex* it is imperative to continue to decrease the vector abundance of the *Culex* species in particular. Without taking preventive actions against the *Culex* species, the Region of Peel may well have seen an increase in their abundance from 2004 to 2005, as evidenced by the increases seen *Coquillettidia perturbans* and *Aedes vexans vexans*, the two most abundance species. All components of the prevention plan need to continue in order to decrease the risk of WNV.

The minimum infection rate (MIR) is used as an indicator of the prevalence of WNV, transmission intensity and therefore, the risk for human disease. WNV MIRs in specific species is expressed as the number infected per 1,000 mosquitoes tested.

Table 16 presents the 2005 MIRs for the *Culex* species, grouped by municipality in Peel Region and compares these to MIRs for 2004 where applicable. Higher MIRs are usually indicative of greater WNV activity among a given species but can be unreliable when the sample size is less than one thousand. In 2005, the MIRs were higher in each respective municipality and as a whole throughout the Region of Peel compared to 2004. The only reliable MIRs, based on a sample size greater than one thousand, are those for *Culex pipiens* in the City of Mississauga, City of Brampton and the Peel Region total. The highest MIR was for the City of Mississauga at 8.59 compared to the City of Brampton at 4.47 and the Peel Region total at 6.76. While the prevalence of *Culex* species relative to the total number of mosquitoes collected was the lowest ever (approximately 5%) the actual number of *Culex* collected was similar to the previous year. The MIR increased because there were more positive pools in 2005 compared to 2004.

Table 16 Minimum Infection Rates of *Culex* Species in Each Municipality - Region of Peel, 2004 and 2005

Municipality	Vector Species	Actual Number Tested	Positive Pools	2005 MIR*	2004 MIR*
Mississauga	<i>Culex pipiens</i>	1,397	12	8.59	-
	<i>Culex pipiens/restuans</i>	627	3	4.78 †	0.91
	<i>Culex restuans</i>	146	1	6.85 †	3.26 †
Brampton	<i>Culex pipiens</i>	1,118	5	4.47	-
	<i>Culex restuans</i>	88	1	11.36 †	-
Caledon	<i>Culex pipiens/restuans</i>	51	1	19.61 †	-
	<i>Culex restuans</i>	17	1	58.82 †	-
Peel	<i>Culex pipiens</i>	2,515	17	6.76	-
	<i>Culex pipiens/restuans</i>	678	4	5.90 †	0.97
	<i>Culex restuans</i>	251	3	11.95 †	1.71 †
Total		3,444	24		

*The Minimum Infection Rate (MIR) is calculated as the number of positive batches of infected mosquitoes of a given species divided by the total number of mosquitoes of a given species that were tested for the presence of the virus, expressed per 1000.

†MIRs based on numbers < 1000 are more likely to unstable than those based on numbers > 1000 (bolded)

Adult Mosquito Surveillance in other Ontario Health Units

Table 17 lists all results of the mosquito testing programs and highlights those municipalities adjacent to the Region of Peel. Twenty-one of the thirty-six health units reported positive mosquito batches. The City of Toronto reported the greatest number of positive pools at 142, followed by Windsor-Essex at 30 and then by the Regions of Peel and Halton at 24 each. Of the total 79,728 pools tested in Ontario from 2002 to 2005, 1,091 (1.37%) were positive and of those, 966 were due to the *Culex* species (88.63 %). Another 5.8% of the positive pools were due to the *Aedes* species¹⁷.

Table 18 presents the national mosquito surveillance data by province/territory. A total of 695 positive pools were reported from five provinces. Ontario reported the greatest number (291), followed by Manitoba (193), Saskatchewan (110), Quebec (100), and Alberta (1).

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Table 17 Mosquito Surveillance Statistics by Health Unit - Ontario, 2005

Health Unit	Total Positive Pools
Algoma Health Unit	1
Brant County Health Unit	0
Chatham-Kent Public Health Division	4
Durham Region Health Department	3
Eastern Ontario Health Unit	0
Elgin-St. Thomas Health Unit	2
Grey-Bruce Health Unit	0
Haldimand-Norfolk Health Unit	1
Haliburton-Kawartha-Pine Ridge District Health Unit	2
Halton Region Health Department	24
City of Hamilton-Public Health & Community Services Dept.	2
Hastings & Prince Edward Counties Health Unit	0
Huron County Health Unit	0
Kingston, Frontenac and Lennox & Addington Health Unit	0
County of Lambton Community Health Services Department	3
Leeds, Grenville and Lanark District Health Unit	0
Middlesex-London Health Unit	12
Regional Niagara Public Health Department	10
North Bay Parry Sound Health Unit	0
North Western Health Unit	0
City of Ottawa Public Health and Long-Term Care Branch	2
County of Oxford	3
Regional Municipality of Peel Health Department	24
Perth District Health Unit	2
Peterborough County-City Health Unit	7
Porcupine Health Unit	0
Renfrew County and District Health Unit	0
Simcoe Muskoka District Health Unit	2
Sudbury and District Health Unit	0
Thunder Bay District Health Unit	0
Timiskiming Health Unit	0
Toronto Public Health	142
Region of Waterloo, Public Health	1
Wellington-Dufferin-Guelph Health Unit	0
Windsor-Essex County Health Unit	30
York Region Health Services Department	14
ONTARIO TOTAL	291

Source: Ontario Ministry of Health and Long-Term Care,
http://www.health.gov.on.ca/english/providers/program/pubhealth/westnile/wnv_05/wnv_mosquitoes.html
 (downloaded December 23, 2005)¹⁷

- Rows shaded in yellow are the municipalities adjacent to the Region of Peel

Table 18 Mosquito Surveillance Statistics by Province, 2005

Province/Territory	No. Confirmed positive mosquito pools
Newfoundland and Labrador	0
Prince Edward Island	0
Nova Scotia	0
New Brunswick	0
Quebec	100
Ontario	291
Manitoba	193
Saskatchewan	110
Alberta	1
British Columbia	0
Yukon Territory	0
Northwest Territories	0
Nunavut	0
Canada – Total	695

Source: Public Health Agency of Canada, 2005
(as of October 5, 2005, downloaded December 23, 2005)¹⁸

Comparison with Great Lakes States

In the United States there were a total of 11,303 cumulative mosquito infections in 2005¹⁸. Table 19 lists total number of cases in the seven Great Lakes States for 2005. The State of Illinois reported the most mosquito infections at 2,498. Wisconsin reported the fewest infections at 22.

Table 19 Number of Mosquito Infections Reported - Great Lakes States, 2005*

State	Number of Mosquito Infections
Illinois	2,498
Indiana	187
Minnesota	62
New York	90
Ohio	1,371
Pennsylvania	338
Wisconsin	22
TOTAL	4,568

*current as of December 20, 2005

Source: United States Centers for Disease Control, 2005 – downloaded December 7, 2005 and United States Geological Service, 2005 (last updated June 27, 2005)¹⁹

Asian Tiger Mosquito (*Stegomyia albopicta*)

In 2005, the first time since the establishment of the West Nile Virus program, the Asian Tiger mosquito, species *Stegomyia albopicta*, was found in the Region of Peel. One mosquito was collected in one trapping event. Two other health units in Ontario collected the Asian Tiger mosquito: Toronto and Ottawa. Like Peel Region, only one mosquito was found in each of the other two health units.

The Asian Tiger mosquito is a vector for a number of viruses including WNV, Eastern Equine Encephalitis and Dengue Fever. The Ministry of Health and Long-Term Care (MOHLTC) included the Asian Tiger mosquito in their 2005 WNV Preparedness and Prevention Plan as a species to identify and be included in viral testing²⁰.



Figure 16 Omni-Directional Fay Prince Trap
(Source: Peel Public Health, WNV Team, 2005)

In 2006, the MOHLTC is sponsoring a special study whose purpose is to determine the abundance of the Asian Tiger mosquito in the three Ontario health units that trapped it in 2005. This study will use a different trap, the Omni-Directional Fay-Prince trap, which is designed to attract specific species including the Asian Tiger mosquito (Figure 16). This trap uses white-black contrast and carbon dioxide to attract mosquitoes and can trap them coming from any direction. Trapping cycles will be adjusted to accommodate the daytime biting behaviour of the Asian Tiger mosquito.