FINAL REPORT

CONTROL OF BITING INSECTS

Kanata North

2025 Season

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Introduction

The quality of life for residents of Kanata North has been impacted by significant populations of “nuisance” mosquitoes. Kanata North Ward is surrounded by major wetlands that contain great biodiversity. The high-water table and flat topography create ideal conditions for mosquito reproduction, leading to the formation of large breeding sites, many of which remain flooded or are refilled with water following rainfall throughout the season. For this reason, GDG Canada was contracted by the City of Ottawa to control spring and summer mosquito larvae by applying a biological larvicide in the Kanata North Ward. The work and treatment were executed by G.D.G. Canada, a full subsidiary of G.D.G. Environment.

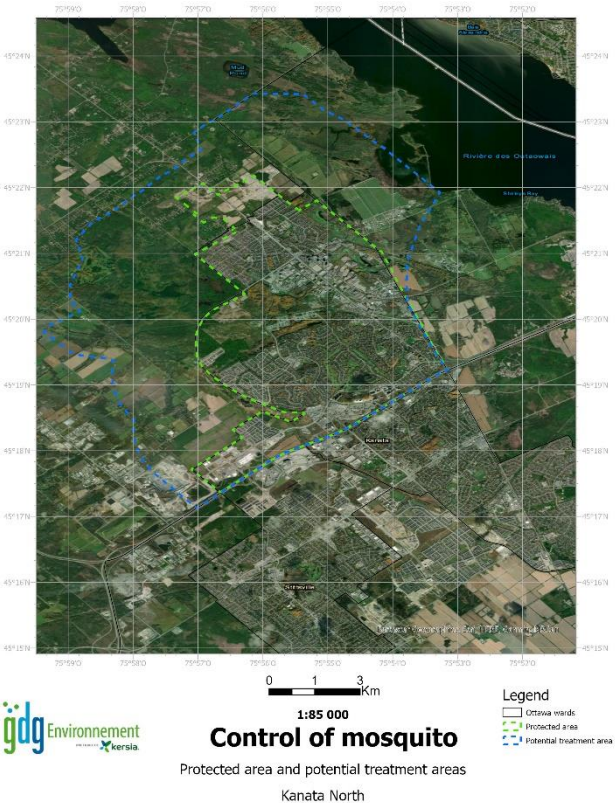

Figure 1. Treatment area in Kanata North

The mosquito control program uses primarily a biological larvicide named *Bacillus thuringiensis israelensis* (Bti), which is applied in the spring to control snowmelt mosquitoes and throughout the summer to control floodwater mosquitoes. *Bacillus sphaericus* (Bsph) is also use in spring but in smaller amounts. Larvicide applications are carried out by helicopter, drone, and ground equipment.

Larval breeding sites are found in environments containing stagnant waters such as wetlands, marshes, bogs, flood plains, poorly drained forests, ditches, etc. Some species prefer temporary environments (rainfall dependent) while others prefer permanent sites (remaining throughout the seasons). Some species have many generations per season (multivoltine), while others have only one generation (univoltine). Additionally, of the approximately 30 species found in the area, some cause nuisance to the residents, while others are only targeting animal species such as amphibians and birds. Due to these factors, it is essential to document the mosquito species composition of the area and categorize the different habitat types to target the correct species that cause nuisance to humans.

This report will outline the operational activities and analysis of mosquito surveillance during the 2025 program. In addition of this report, weekly reports have been sent to city authorities, intended for public information. Finally, monthly meetings also took place with city authorities for program follow up.

Kanata North Project History

GDG Canada has operated in the Kanata North ward since the inception of the City of Ottawa's West Nile virus program in 2003. As the service provider for the City of Ottawa's WNv program, GDG Canada has become familiar with the increasing nuisance mosquito situation in Kanata North. Before the start of the nuisance control program, GDG Canada and Ottawa public health (OPH) had already been fielding phone calls from citizens in the Kanata North ward concerning nuisance caused by mosquitoes.

Under the West Nile virus mandate, mosquito monitoring has demonstrated that these mosquitoes are not efficient vector carriers of WNv. But these mosquitoes will seek a blood meal from humans, and they can prevent residents from enjoying both their backyard and the outdoor areas of their community. To gain further insight into the nuisance situation, GDG Canada conducted at their own cost an operational study in the Morgan Grant and Beaverbrook neighbourhoods of Kanata North on the mosquito population composition and dynamics.

This study was conducted in 2014 and 2015 enabling GDG Canada to gain a better understanding of the breeding sites in the surrounding areas, allowing us to determine the sources of the mosquito nuisance. GDG Canada performed trapping and monitoring for mosquito population and species identification, including larval and adult mosquito surveillance, and breeding site mapping around and within the ward of Kanata North. The objective of this trapping and monitoring was to identify the realistic requirements of a program that will have a noticeable impact on the quality of life for the residents and visitors of Kanata North, while maintaining the area's ecological integrity. Larval sampling has provided insight into the spatial and temporal distribution of nuisance mosquito breeding sites.

The entomology trapping and monitoring conducted by GDG Canada in Kanata North determined that the major cause of nuisance stemmed from the species *Ochlerotatus (Oc) stimulans, Oc. provocans, Oc. excrucians, Oc. trivitatus, Oc. japonicus, Aedes vexans* and *Coquillettidia perturbans* (CQP).

During our spring survey, the larval sampling results revealed the presence of *Oc. stimulans*, *Oc. provocans, Oc. abserratus* and *Oc. excrucians,* four aggressive species that bite humans when seeking a blood meal. These species emerge after snowmelt in non-permanent and permanent standing water sites. They have one generation per season, and their eggs will hatch in temporary standing water, caused by spring snowmelt or where the Carp River overflows its banks. The eggs will only hatch in the spring, as they must go through a dry period followed by a freezing period before hatching. Hatching is triggered by immersion in water followed by a drop in dissolved oxygen levels. Once eggs have hatched, larvae will emerge.

During our summer survey, the larval sampling results revealed the presence of *Oc. trivittatus, Aedes vexans,* and *Oc. japonicus*, three species that bite humans when seeking a blood meal. These species emerge following significant rainfall event and have many generations per summer depending on rainfall frequency. The eggs will only hatch once they go through a dry period

followed by a flooded period. In contrast, *Oc. japonicus* emerge from artificial sites (tires, gutter, tarp, etc.), *Oc. trivittatus* emerge from river floodplains (ex.: Carp River) and *Aedes vexans* grows in ground depressions that have been flooded by rain or from overflowing rivers. The hydrography of the Carp River and the Beaver Pond is very favorable to the development of summer mosquitoes due to its fluctuations in water levels following each rain.

Kanata North is surrounded by many wetlands that contain cattail marsh, especially in the South Marsh Highlands Conservation Forest, the Kizell Pond and the Beaver Pond areas. The cattail marshes are ideal sites for *Coquillettidia perturbans (*CQP*)* development. These mosquitoes overwinter as larvae attached to the roots of cattail plants. CQP has a unique life cycle and is the only specie of mosquitoes that overwinter as larvae. This specie only has one generation per summer and emerge as adult mosquitoes in late June and early July. Primarily active late in the evening, they are aggressive biters and are a very noticeable nuisance.

The following map identifies an estimated productivity gradient for the breeding sites located in the Kanata North area.

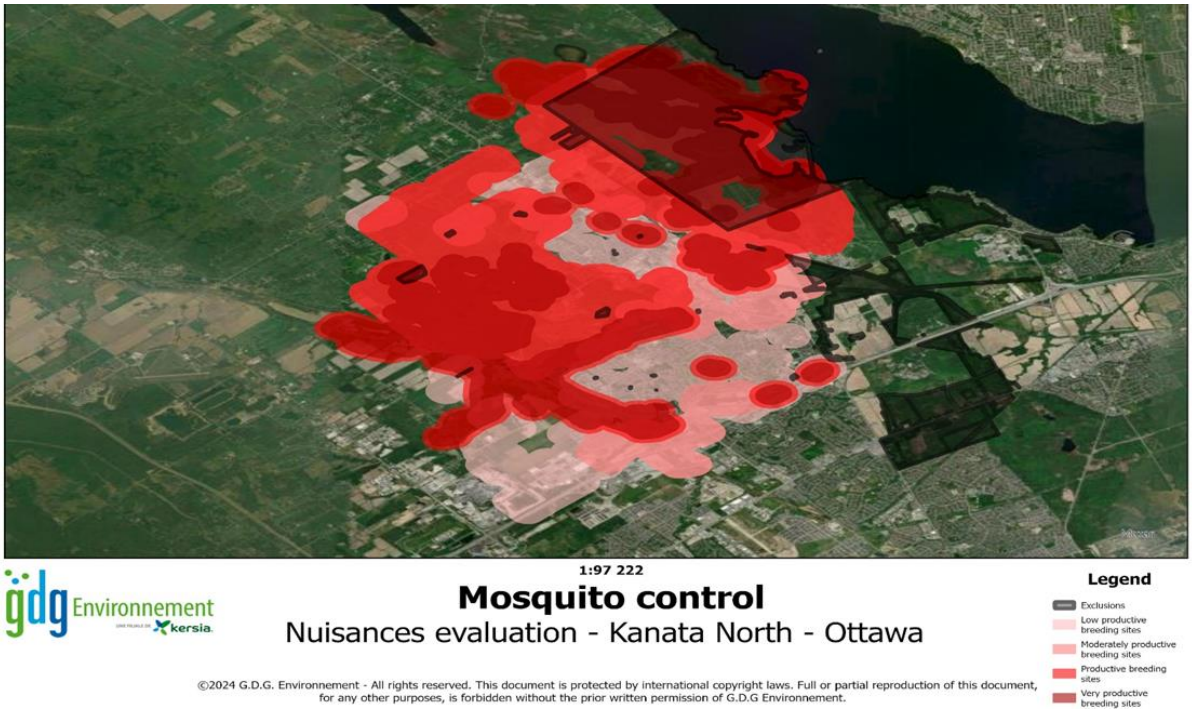

Figure 2. Estimated productivity gradient for breeding sites located in the Kanata North area

The key to a successful program is monitoring larval development stages and sequencing the treatments based on the larval surveillance data results.

Larvicide Products and Permits

Larvicide products used

G.D.G. Canada uses a biological insecticide called *Bacillus thuringiensis israelensis* (Bti) to control mosquito larvae. This bacterium is unique because it only causes mortality to the larval stages of dipteran insect species, such as mosquitoes and black flies. It does not impact non-target species such as amphibians, fish or wildlife. The active ingredient in Bti is a small diamond-shaped protein crystal produced over the fermentation process of the bacterium. This bacterium occurs naturally in the soil and is not the result of genetic manipulation.

Mosquito larvae are known as filter feeders, this means, when the larvae filter water to find food, the Bti is ingested. These crystal-shaped proteins become toxic only when the Bti enters the insect's gut. At this point, the Bti crystals react with the high pH level in the gut, and then the gut wall gets perforated. The content of the gut spill into the body cavity, and death occurs within few hours.

Bti comes in two forms; a water-based liquid and a granular product that uses corn granules as a carrier. The liquid formulation is used to control mosquito larvae in stagnant water, and it can also control black flies when applied in running water. The granular formulation is applied to standing water; it floats for a short while, releasing the Bti product dose to the mosquito larvae, which feed near the water surface.

A portion of the applications are made from the ground with trained and licensed field technicians equipped with backpack sprayers. Our aerial support team can treat larger areas more efficiently, as well as the harder-to-reach sites. Bti formulations may be applied several times during the spring and summer to control successive generations and species of mosquitoes as they emerge at various periods throughout the year, from early spring until the first frost.

Over the years, Bti has proven to be a quality product that provides consistent, cost-effective results. It is the biological insecticide now used worldwide to control the mosquito species that can carry harmful and debilitating diseases such as West Nile Virus, Encephalitis, Chikungunya, Dengue Fever and Zika virus. However, in Canada, residents of many communities where mosquito control programs are conducted can now fully enjoy the outdoors and experience a better quality of life.

To control specifically *Coquillettidia perturbans* larvae, GDG Canada uses another biological larvicide called *Bacillus sphaericus* (Bsph). This Bacteria acts similarly and is as specific as the Bti. The Bsph is used once in spring in permanent cattail sites.

Mosquito treatment

Spring Treatment

An orientation meeting was held on April 8th between authorities of the Town and those from G.D.G. Canada. The first pre-treatment monitoring was completed on April 14th. During the first monitoring, we observed that hatching had started, and that 1st and 2nd instar larvae were found in most sites, indicating the start of egg hatch.

The permanent team arrived in Kanata North on April 14th. The spring treatment started when most larvae were in their 2nd instar in the warmer sites. Our team also ensured that the larval egg hatch was complete before starting the treatment. Biological larvicide application began on April 17th. Ground treatment was performed from April 17th to May 12th. Aerial treatment with helicopter occurred between May 1st and May 12th. The spring treatment was completed about two weeks later than last year, which had occurred earlier than usual.

Post-treatment monitoring was completed 48 hours after the treatment of each site. Results of the monitoring showed near 100% efficacy of larval mortality. However, in a few places, touch-up treatments were completed when necessary.

Coquillettidia perturbans Treatment

Mosquitoes of the specie *Coquillettidia perturbans* develop in permanent cattail sites. The larvae of this species hatch from August and overwinter as larvae in wet environments. The larvae are not freely present in the water column, but attach to the roots of emergent aquatic plants. Therefore, they develop in permanent wet environments with high nutrient inputs.

An aerial treatment was conducted on May 11th when the water is warm enough for larval activity. This treatment is conducted independently of other treatments since this specie has a different developmental cycle from other mosquito larvae included in the control program. The product used to control most other mosquito species is ineffective against this species. Another biological product must be used: VectoLex CG.

Summer Treatments

Throughout the summer, monitoring and surveillance was performed every week and according to rainfall accumulations, due to mosquito development being dependent on precipitation. After every rain event, the permanent team verifies the four rain gauges installed in Kanata to have a more precise view of the local water accumulations. The Carp River area is also monitored multiple times after a rain event, since the water level can fluctuate one day or more than after the event, or when it has only been raining south of the protected area. According to Environnement Canada (Table 3), this summer season was very dry, with low levels of precipitation. Despite these conditions, the field teams worked every week to monitor larval populations and to carry out both ground and aerial treatments when necessary. We performed 6 summer treatments in 2025.

Table 1. Total monthly rainfall accumulations of 2025 and 1991-2024 average (Source: Environment Canada Ottawa Intl A weather station)

Month	2025	1991-2024
April	95.6	88.4
May	60.7	66.3
June	65.5	106.3
July	48	115.7
August	48.2	105.9
September	31.5	68.5
Total	**349.5**	**551.1**

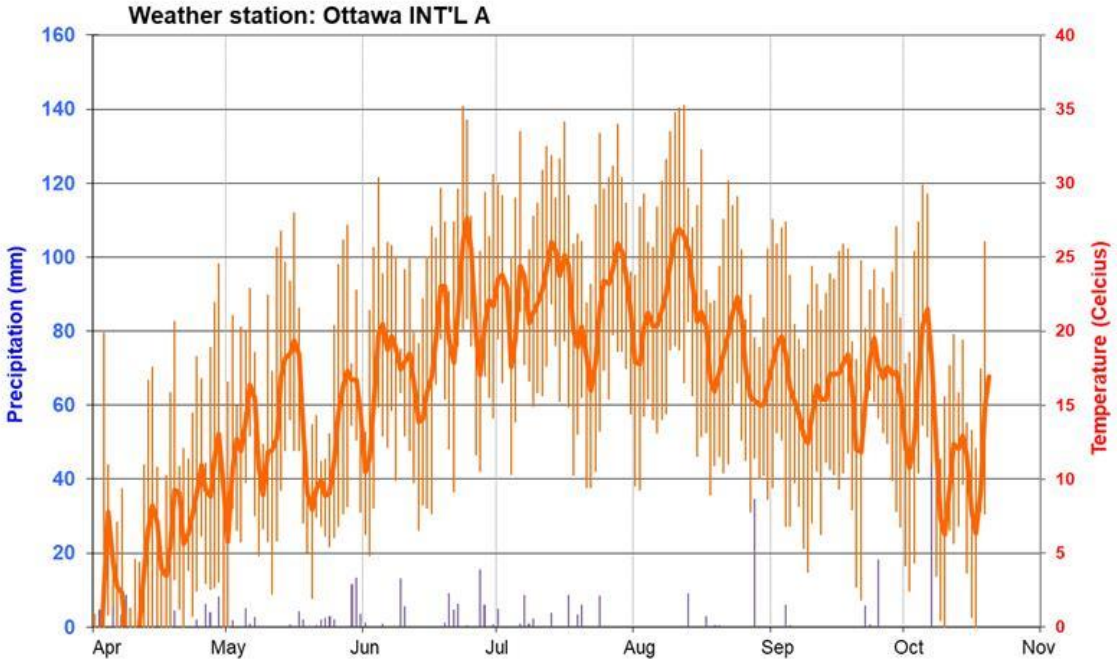

Figure 3. 2025 April to September daily total precipitation (mm) and mean temperatures in Ottawa

Table 2. Summary of Treatments

Treatment	Beginning	End	Type of treatment
1	April 17th	May 12nd	Ground and aerial (helicopter)
CQ	May 11th		Aerial (helicopter)
2	May 22nd		Ground
3	June 5th	June 7th	Ground and aerial (drone)
4	June 11th	June 14th	Ground and aerial (drone)
5	June 29th	June 30th	Ground and aerial (drone)
6	July 11th		Ground
7	July 23th		Ground

Sweep Net Tests

Operational efficiency is also measured by calculating the level of nuisance reduction caused by biting insects using the nuisance sweep net tests. The sweep tests were conducted from the week of May 20th to September 10th for a total of 135 nuisance sweep tests in the protected area and 34 nuisance sweep tests in the unprotected area.

The method is used to identify the number of insects that could bite us over a period of five minutes. Each test must be performed under the same conditions (weather, clothing, manipulations, no insect repellent) and repeated at different locations inside the protected area. The effectiveness of the treatment is calculated on the average catch for the eight (8) stations weekly. The average catch should be less than five (5) mosquitoes. Moreover, if one of the eight (8) stations displays a capture rate of more than fifteen (15) mosquitoes, the test is considered failed. All tests done in 2025 complied with requirements, except for May 27th, where only seven stations in the protected area were visited by mistake.

Similarly to last year, each test conducted in the protected area was compared to the average catch for two outside stations, that were identified by City authorities. These tests were conducted on the same day and following the same procedure, to evaluate the effectiveness of the treatments carried out throughout the season. This program aims to reduce the nuisance caused by mosquitoes by at least 80%.

The sweep test locations are indicated on Figure 4 and 5. The average for the season was 0,07 mosquito captures per test in the protected area, and 3 mosquitos captures in the unprotected area. The percentage of nuisance reduction between the protected area and the unprotected area is 95,4%. Black fly populations are high in some sectors of Kanata North and can be a nuisance to citizens, but they are not included in the control program, as they come from different breeding sites than mosquitoes. Detailed results are shown in table 3 and identification are shown in table 4.

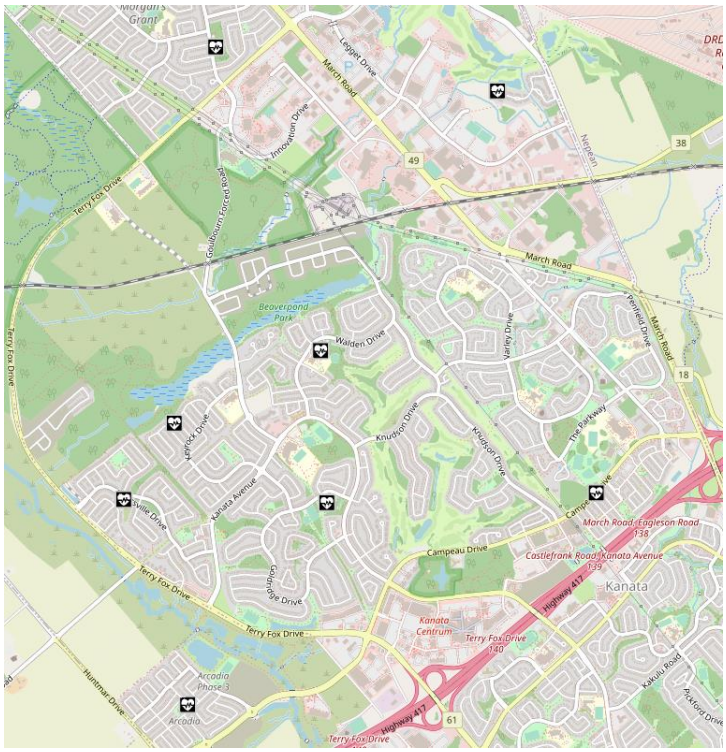

Figure 4. Sweep net tests locations in the protected area

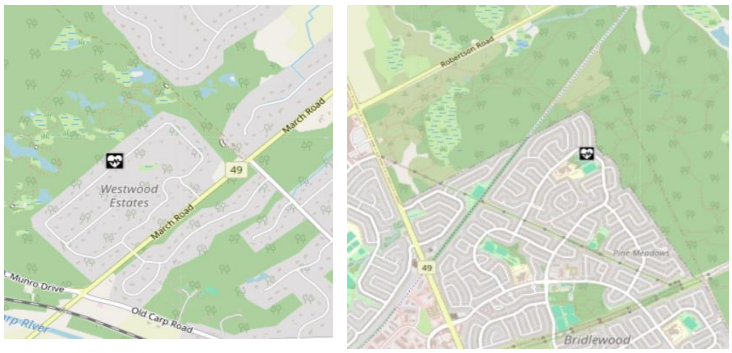

Figure 5. Sweep net tests locations in the unprotected area

Table 3. Sweep net tests results (1/2)

Date	Time	Address - Protected area	Mosquito	Black flies	Other species	Address - Unprotected area	Mosquito	Black flies	Other species	% Efficacity (Mosquito)
May 20th	19:18	124 marsh sparrow	2	5	1	Out average	1,5	1,5	1,5	0,0%
	19:40	2600 Campeau Dr.	0	0	0					100,0%
	18:32	Calvington avenue	0	0	0					100,0%
	18:31	35 Arkose street	0	0	0					100,0%
	18:58	Laughlin cercle	0	0	4					100,0%
	19:17	400 Goldridge	0	3	2					100,0%
	20:05	Walden park	0	5	0					100,0%
	19:40	50 Flamborough way	0	1	0					100,0%
May 27th	18:45	124 marsh sparrow	0	2	14	Out average	2	1	4	100,0%
	19:02	2600 Campeau Dr.	0	5	0					100,0%
	20:37	Calvington avenue	0	0	10					100,0%
	20:10	35 Arkose street	0	0	3					100,0%
	19:43	Laughlin cercle	0	3	4					100,0%
	19:20	400 Goldridge	0	0	2					100,0%
	18:46	50 Flamborough way	1	0	1					50,0%
June 5th	18:46	124 marsh sparrow	0	13	2	Out average	5	0,5	9	100,0%
	19:49	2600 Campeau Dr.	0	3	1					100,0%
	20:16	Calvington avenue	0	3	5					100,0%
	19:49	35 Arkose street	0	4	10					100,0%
	19:24	Laughlin cercle	0	0	5					100,0%
	19:02	400 Goldridge	0	0	2					100,0%
	19:26	Walden park	0	6	2					100,0%
	19:05	50 Flamborough way	0	0	2					100,0%
June 13th	18:42	124 marsh sparrow	0	21	7	Out average	10,5	0	2,5	100,0%
	19:44	2600 Campeau Dr.	0	49	5					100,0%
	19:52	Calvington avenue	0	3	30					100,0%
	19:27	35 Arkose street	0	0	3					100,0%
	19:04	Laughlin cercle	0	9	5					100,0%
	18:42	400 Goldridge	0	0	1					100,0%
	19:21	Walden park	0	16	5					100,0%
	19:01	50 Flamborough way	0	3	5					100,0%
June 20th	18:40	124 marsh sparrow	0	32	2	Out average	11,5	3	20	100,0%
	19:44	2600 Campeau Dr.	0	2	40					100,0%
	19:40	Calvington avenue	0	0	8					100,0%
	19:28	35 Arkose street	0	20	10					100,0%
	19:06	Laughlin cercle	1	17	6					91,3%
	18:43	400 Goldridge	0	5	3					100,0%
	19:18	Walden park	0	38	3					100,0%
	19:00	50 Flamborough way	0	1	3					100,0%
June 25th	18:40	124 marsh sparrow	0	15	3	Out average	2	2	12,5	100,0%
	19:52	2600 Campeau Dr.	0	2	2					100,0%
	19:42	Calvington avenue	0	1	25					100,0%
	19:19	35 Arkose street	0	7	8					100,0%
	18:56	Laughlin cercle	0	8	7					100,0%
	18:34	400 Goldridge	1	0	2					50,0%
	19:36	Walden park	0	64	4					100,0%
	19:10	50 Flamborough way	0	8	8					100,0%
July 2nd	18:41	124 marsh sparrow	0	4	24	Out average	3,5	57	7	100,0%
	19:45	2600 Campeau Dr.	0	1	18					100,0%
	19:48	Calvington avenue	0	14	2					100,0%
	19:24	35 Arkose street	0	51	0					100,0%
	19:00	Laughlin cercle	0	17	3					100,0%
	18:44	400 Goldridge	0	26	1					100,0%
	18:25	Walden park	0	7	1					100,0%
	19:11	50 Flamborough way	0	9	4					100,0%
July 11th	18:43	124 marsh sparrow	0	21	0	Out average	3,5	21	4,5	100,0%
	19:40	2600 Campeau Dr.	1	3	2					71,4%
	19:33	Calvington avenue	0	10	15					100,0%
	19:21	35 Arkose street	0	0	5					100,0%
	18:59	Laughlin cercle	0	10	7					100,0%
	18:40	400 Goldridge	0	0	3					100,0%
	19:18	Walden park	0	13	1					100,0%
	18:59	50 Flamborough way	0	2	3					100,0%

Table 3. Sweep net tests results (2/2)

July 15th	18:45	124 marsh sparrow	0	1	8	Out average	0	33	3,5	N/D
	19:52	2600 Campeau Dr.	0	1	0					N/D
	18:51	Calvington avenue	0	1	10					N/D
	19:20	35 Arkose street	0	4	5					N/D
	19:34	Laughlin cercle	0	25	2					N/D
	18:42	400 Goldridge	0	21	2					N/D
	20:09	Walden park	0	3	1					N/D
	19:15	50 Flamborough way	0	0	2					N/D
July 23rd	19:27	124 marsh sparrow	1	69	0	Out average	4	11,5	1	75,0%
	19:40	2600 Campeau Dr.	0	5	0					100,0%
	19:46	Calvington avenue	0	1	8					100,0%
	19:25	35 Arkose street	0	30	0					100,0%
	19:04	Laughlin cercle	0	2	11					100,0%
	18:44	400 Goldridge	0	0	2					100,0%
	18:38	Walden park	1	0	4					75,0%
	18:59	50 Flamborough way	0	27	0					100,0%
July 30th	18:42	124 marsh sparrow	0	7	2	Out average	1	6	3,5	100,0%
	19:58	2600 Campeau Dr.	0	3	0					100,0%
	19:42	Calvington avenue	0	0	3					100,0%
	19:24	35 Arkose street	0	6	2					100,0%
	19:11	Laughlin cercle	0	28	5					100,0%
	18:52	400 Goldridge	0	4	3					100,0%
	19:29	Walden park	0	80	0					100,0%
	19:03	50 Flamborough way	0	3	3					100,0%
August 4th	18:44	124 marsh sparrow	0	2	3	Out average	0,5	1	4,5	100,0%
	19:28	2600 Campeau Dr.	0	2	0					100,0%
	19:44	Calvington avenue	0	1	5					100,0%
	19:31	35 Arkose street	0	11	3					100,0%
	18:55	Laughlin cercle	0	2	3					100,0%
	18:46	400 Goldridge	0	1	2					100,0%
	20:37	Walden park	0	1	0					100,0%
	19:07	50 Flamborough way	0	0	1					100,0%
August 14th	18:40	124 marsh sparrow	0	7	3	Out average	0,5	10	4	100,0%
	19:59	2600 Campeau Dr.	0	2	0					100,0%
	19:41	Calvington avenue	0	0	9					100,0%
	19:21	35 Arkose street	0	0	10					100,0%
	18:59	Laughlin cercle	0	0	8					100,0%
	18:36	400 Goldridge	0	0	2					100,0%
	19:26	Walden park	0	1	0					100,0%
	19:12	50 Flamborough way	0	1	2					100,0%
August 21st	18:44	124 marsh sparrow	0	2	6	Out average	0	2	3	N/D
	19:35	2600 Campeau Dr.	0	1	1					N/D
	19:43	Calvington avenue	0	0	11					N/D
	19:21	35 Arkose street	0	0	9					N/D
	19:01	Laughlin cercle	0	0	8					N/D
	18:39	400 Goldridge	0	0	8					N/D
	20:37	Walden park	1	0	0					0,0%
	19:13	50 Flamborough way	0	0	2					N/D
August 26th	18:37	124 marsh sparrow	0	0	4	Out average	2	1	2	100,0%
	19:57	2600 Campeau Dr.	0	2	1					100,0%
	19:38	Calvington avenue	0	0	3					100,0%
	19:28	35 Arkose street	0	2	3					100,0%
	19:09	Laughlin cercle	0	3	4					100,0%
	18:51	400 Goldridge	0	0	5					100,0%
	19:40	Walden park	0	0	0					100,0%
	19:12	50 Flamborough way	0	3	0					100,0%
September 2nd	18:48	124 marsh sparrow	0	7	20	Out average	0	0	2	N/D
	19:14	2600 Campeau Dr.	0	4	6					N/D
	20:52	Calvington avenue	0	0	3					N/D
	20:31	35 Arkose street	1	0	7					0,0%
	20:11	Laughlin cercle	0	0	5					N/D
	19:52	400 Goldridge	0	2	3					N/D
	19:34	Walden park	0	10	7					N/D
	18:30	50 Flamborough way	0	7	3					N/D
September 10th	18:44	124 marsh sparrow	0	0	10	Out average	0	0	0	N/D
	19:04	2600 Campeau Dr.	0	0	8					N/D
	20:28	Calvington avenue	0	0	6					N/D
	20:09	35 Arkose street	0	0	11					N/D
	19:49	Laughlin cercle	0	0	11					N/D
	19:32	400 Goldridge	0	0	8					N/D
	19:14	Walden park	0	0	20					N/D
	18:30	50 Flamborough way	0	0	9					N/D
		Average	0,07			Average	3			95,4%

Table 4. Identification of mosquitoes captured

Protecte area		
Species	**Quantity**	**Pourcentage**
Aedes vexans	1	10%
Anopheles punctipennis	1	10%
Coquillettidia perturbans	4	40%
Culex pipiens-restuans gr.	1	10%
Ochlerotatus communis gr.	1	10%
Ochlerotatus trivittatus	2	20%
Total	10	100%
Unprotected area (Out stations)		
Species	**Quantity**	**Pourcentage**
Aedes vexans	25	26%
Anopheles punctipennis	1	1%
Coquillettidia perturbans	14	15%
Culicidae Mâle	1	1%
Culicidae sp.	9	9%
Ochlerotatus abserratus-punctor gr.	2	2%
Ochlerotatus communis gr.	11	12%
Ochlerotatus provocans	14	15%
Ochlerotatus sp.	2	2%
Ochlerotatus stimulans gr.	12	13%
Ochlerotatus trivittatus	4	4%
Total	95	100%

In the protected area, only 10 mosquitos were captured during the season. Of that number, most of the mosquito species captured were *Coquillettidia perturbans (CQP)*.

In the out stations, 95 mosquitos were captured during the season. In the samples, about half are spring species that appear as soon as the snow melts, while the other half are summer species that mostly require the reflooding of habitats.

Nuisance caused by mosquitos has been significantly reduced across the entire territory, due to weekly inspections, the coordination of ground and aerial treatments, thorough knowledge of the Kanata North area, as well as the team's expertise. This year's weather conditions have also helped keep mosquito development at a low level.

As a clarification, when a mosquito is too damaged to be identified, it will be classified as *Culicidae sp.* or by the identifiable genus (e.g., *Ochlerotatus sp.*).

CDC Light traps

The CDC light traps are used to capture adult mosquitos using primarily dry ice. These traps help us identify the species in place and therefore better target our operations. At minimum, three CDC light traps were installed in the protection area weekly, from the week of May 21st to September 25th. Traps were installed in the afternoon and collected the following morning. Additionally, some other traps were also installed in citizens' backyards, for example, to identify and quantify the nuisance after a request.

Once mosquitoes were collected, they were placed on dry ice and shipped to our laboratory to identify at the specie level. This allowed GDG Canada to document the mosquito species present in the protected area.

Trapping locations are shown in Figure 6. Table 5 and 6 present the average mosquito captured by species. Table 5 presents the data by the seasonal distribution, while table 6 presents it by the geographical distribution.

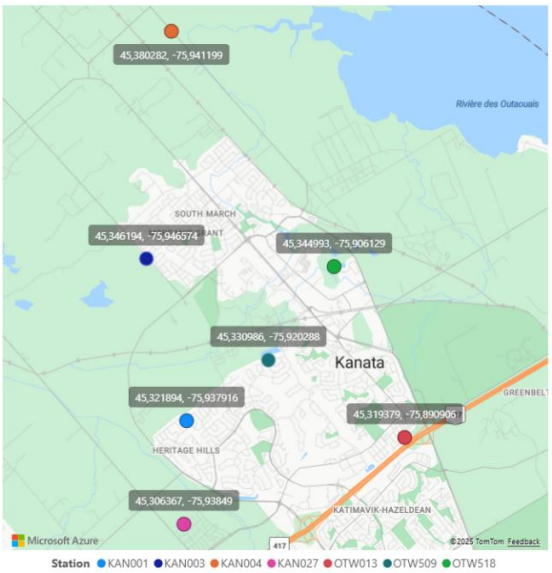

Figure 6. CDC trap locations for the trapping period

The most abundant species captured was *Coquillettidia perturbans (CQP) (table 5 and 6).* According to table 5, an average of 5 mosquitoes were captured within the protected area, per trap per night, which is very low. As indicated above, this summer season was very dry, with low levels of precipitation. These conditions were not favorable for the development of floodwater summer mosquitoes, such as *Oc. trivittatus* and *Aedes vexans*.

According to Table 6, week 31 (July 31st) was the week during which the most mosquitoes were captured. This coincides with the week when the capture of CQP was most pronounced in the traps.

Kanata North contains many wetlands that contain cattail marsh (breeding site of CQP), especially in the South Marsh Highlands Conservation Forest sector, the Carp River, the Kizell Pond and the Beaver Pond areas. Also, the mild winter temperatures and the large amounts of precipitation received in 2024 could partly explain the strong presence of *Coquillettidia perturbans* this year. It is also worth mentioning that *CQP* moves over greater distances than other summer species, and the nuisance could very likely come from outside the treated area.

Last year, we discovered many new breeding sites, which were treated this spring. However, this year we again discovered several other new CQP breeding sites that were not productive and had not been mapped previously. We plan to treat these sites in spring 2026.

Table 5. Average captured mosquitoes per CDC week.

Locality	Site	*Aedes cinereus*	*Aedes vexans*	*Anopheles punctipennis*	*Anopheles quadrimaculatus*	*Anopheles sp.*	*Anopheles walkeri*	*Coquillettidia perturbans*	*Culex pipiens-restuans gr.*	*Culex territans*	*Ochlerotatus abserratus-punctor gr.*	*Ochlerotatus canadensis*	*Ochlerotatus cantator*	*Ochlerotatus communis gr.*	*Ochlerotatus dorsalis*	*Ochlerotatus japonicus*	*Ochlerotatus provocans*	*Ochlerotatus sp.*	*Ochlerotatus sticticus*	*Ochlerotatus stimulans gr.*	*Ochlerotatus triseriatus-hendersoni gr.*	*Ochlerotatus trivittatus*	*Ochlerotatus-banded legs*	*Ochlerotatus-black legs*	*Psorophora ferox*	*Uranotaenia sapphirina*	**Total of captured mosquitos**	**Average/trap/night**
Kanata-Interior	KAN001		2	1				2	2								1										8	**4**
Kanata-Interior	KAN003		4	2	2		1	4	3		1	1					1				1	2					22	**7**
Kanata-Interior	KAN004		1		1			1	1				1									1					6	**6**
Kanata-Interior	KAN027								1								1										2	**2**
Kanata-Interior	OTW013	2	10	8	4			13	13					2		3	2	1		2	1	2					63	**4**
Kanata-Interior	OTW509	3	10	8	8	1	4	14	13	3		1				8	2			3	8	8		1	1	2	98	**6**
Kanata-Interior	OTW518	2	15	10	9	1	7	12	10				2	1	1		2	3	1	4		2	1	2		3	88	**6**
Total		**7**	**42**	**29**	**24**	**2**	**12**	**46**	**43**	**3**	**1**	**2**	**3**	**3**	**1**	**11**	**9**	**4**	**1**	**9**	**10**	**15**	**1**	**3**	**1**	**5**	**287**	**5**
%		**2**	**15**	**10**	**8**	**1**	**4**	**16**	**15**	**1**	**0**	**1**	**1**	**1**	**0**	**4**	**3**	**1**	**0**	**3**	**3**	**5**	**0**	**1**	**0**	**2**	**100**	

Table 6. Average captured mosquitoes per CDC light trap sampling site.

Week	*Aedes cinereus*	*Aedes vexans*	*Anopheles punctipennis*	*Anopheles quadrimaculatus*	*Anopheles sp.*	*Anopheles walkeri*	*Coquillettidia perturbans*	*Culex pipiens-restuans gr.*	*Culex territans*	*Ochlerotatus abserratus-punctor gr.*	*Ochlerotatus canadensis*	*Ochlerotatus cantator*	*Ochlerotatus communis gr.*	*Ochlerotatus dorsalis*	*Ochlerotatus japonicus*	*Ochlerotatus provocans*	*Ochlerotatus sp.*	*Ochlerotatus sticticus*	*Ochlerotatus stimulans gr.*	*Ochlerotatus triseriatus-hendersoni gr.*	*Ochlerotatus trivittatus*	*Ochlerotatus-banded legs*	*Ochlerotatus-black legs*	*Psorophora ferox*	*Uranotaenia sapphirina*	**Total of captured mosquitos**	**Average/trap/night**
21			1					4		1				1		5		1			1					**14**	**2**
22					1	1							1						1		2		1			**7**	**2**
23																											
24	2	2	3	1	1	1	3	3				1	1		1	2			3							**24**	**8**
25	2	3	2	2		2	3	1					1		2	2	1		1				1			**23**	**8**
26		2					3	2												1						**8**	**3**
27	1	3	1				4	1																		**10**	**3**
28	1	3	3	2		2	5	2											1	2	2			1		**24**	**8**
29		3	2	1			3	2												1	1					**13**	**4**
30	1	3	3	2		1	3	3			1	1			1		1		1	1	2					**24**	**8**
31		10	5	6		3	12	8	1		1	1			1				1	2	4					**55**	**9**
32		3	2	3		1	3	3	1						2				1	1	1	1	1			**23**	**8**
33		2	1	1		1	4	2	1						1					1	1				1	**16**	**5**
34		3	2	3			3	3							1		1			1	1				1	**19**	**6**
35		1	1	2				3																		**7**	**2**
36			3	1				3																	1	**8**	**3**
37																											
38		2						1							1										1	**5**	**2**
39		2						2							1		1								1	**7**	**2**
Total	**7**	**42**	**29**	**24**	**2**	**12**	**46**	**43**	**3**	**1**	**2**	**3**	**3**	**1**	**11**	**9**	**4**	**1**	**9**	**10**	**15**	**1**	**3**	**1**	**5**	**287**	**5**
%	**2**	**15**	**10**	**8**	**1**	**4**	**16**	**15**	**1**	**0**	**1**	**1**	**1**	**0**	**4**	**3**	**1**	**0**	**3**	**3**	**5**	**0**	**1**	**0**	**2**	**100**	

Citizen Requests

Citizen can contact GDG directly by email at info.mosquito@gdg.ca or by calling the toll-free hotline 1-877-277-0552. Some requests are also transferred to GDG by the City. The local coordinator contacts the citizens within 48h, as far as possible, and a visit is usually made to investigate the origin of the nuisance problem, if needed.

In 2025, 10 citizen requests have been received, investigated, and solved. In comparison, in 2024, we receive 59 citizen calls and in 2023, we receive 148 citizen calls (Table 7).

Table 7. Yearly Comparison of citizen requests

Month	2025	2024	2023
March and April	3	11	0
May	2	5	5
June	2	8	0
July	3	29	142
August	0	6	1
September	0	0	0
Total	**10**	**59**	**148**

Recommendations

The following recommendations and considerations are intended to improve the success of the Kanata North ward's mosquito control program. The objective is to offer a better-quality life to the citizens of Kanata North:

- Due to the mandatory 45-day evaluation period by the MECP, the permit request letter should be sent out to the MECP by the first week of January to be able to respond to issues that could arise.
- The MECP notice letter for objection must be sent out by January 20th and responses received by February 20th, giving time for GDG to meet with crucial objectors as to evaluate their concerns and explain the program.
- GDG proposes to attend the Councillor's annual activity to conduct mosquito clinics and answer questions from citizens.
- A four to five-question survey (T.B.D.) should also be included when the opt-out letter is sent out to the residents within the treatment area.
- It is essential to always consider the Bti in further conservation plans in the Kanata North area. Since it's a biological larvicide with a low risk for human health and natural habitats, Bti should be compatible with conservation plans.

Communications

Mosquitoes as Vectors of Diseases

In the current context of climate change and evolving ecosystems, mosquitoes are becoming an increasingly significant concern. These insects, once considered mere summertime nuisances in our latitudes, are now major vectors of serious diseases. The rise in mosquito-borne viruses affecting humans and animals—such as West Nile virus, California serogroup virus, and Eastern equine encephalitis—highlights the critical importance of protecting ourselves against these vectors.

Introduced to Canada in 2002, West Nile virus quickly raised alarm. It can cause a range of symptoms, from fever and joint pain to severe neurological complications. While most infections are asymptomatic or mild, severe cases can have serious consequences and require urgent medical attention.

The California serogroup virus, although less publicized, is also an increasing threat in Canada. Associated with flu-like symptoms, it can lead to serious complications, particularly in vulnerable populations such as young children and the elderly.

Eastern equine encephalitis is another rare but severe mosquito-borne disease. This viral infection can cause brain inflammation, leading to serious neurological disorders and, in some cases, permanent damage or death. At the end of August, GDG detected the presence of this virus (EEE) in the city of Ottawa. The city later officially announced the death of a resident.

Considering these growing risks, prevention is essential. Responsible mosquito population management using biological larvicides is an effective way to limit their spread. Additional measures, such as wearing protective clothing and cleaning small breeding sites around homes, are also important precautions. In short, vigilance and prevention are key in the face of the growing mosquito threat. By taking proactive steps to protect ourselves, we can minimize the risk of disease transmission and improve quality of life during the summer months.

We also recommend including the installation of at least one CDC Light Trap for adult mosquitoes in the new call for tenders. This entomological trapping will allow for monitoring mosquito abundance in the area, as well as virus detection through PCR analysis of collected samples.

Public Health

Learn about mosquitoes, mosquito control, and the measures you can take to protect yourself from bites: [Mosquitoes - Canada.ca]

Safety of Biological Larvicides

The use of Bti is based on a strong scientific consensus. There is a vast body of scientific literature on the subject, and there is no doubt that the safety aspect of the product is well established.

In 2008, an assessment of the available scientific data revealed that Bt-based products pose no unacceptable risk to human health or the environment when used according to the instructions on their label […]. (Health Canada, 2008).

In 2018, Environment and Climate Change Canada (ECCC) and Health Canada published the Assessment as part of the scientific risk assessment procedure for regulated microorganisms. In this assessment, which combines all varieties of Bt as in previous evaluations, it is stated: "Despite the ubiquity and significant use of various subspecies of B. thuringiensis, there are no known harmful effects at the population level on targeted species in the ecosystems where they are used, and no harmful effects on non-target terrestrial or aquatic plants, vertebrates, or invertebrates."

For more information on biological products and our services:

- Health Canada, Search Product Label : Pesticide Label Search - Health Canada (hc-sc.gc.ca)
- Brochure « Integrated Management of Mosquito Populations » (French only) : https://www.gdg.ca/wp-content/uploads/2023/04/GDG-offre-gestion-moustiques.pdf
- Document « Everything you need to know about BTI » : Document-Mise-a-jour-Bti-2022-ENG.pdf (gdg.ca)

Conclusion

This final report for the 2025 season is a summary of the operations carried out under the mosquito control program using biological larvicides in Kanata North. Our strong knowledge of the municipality's territories and the biology of the biting species present have effectively reduced the intensity and duration of the nuisance while ensuring safety for the environment.

Our team is proud to have collaborated with the City of Ottawa to successfully implement the program and make a significant difference in the quality of life for citizens. The objective of the program is not the complete eradication of biting insects, but rather to reduce the nuisance they cause. The nuisance mosquito control program has the advantage of reducing the intensity and the duration of mosquito nuisance in the protected area. With this in mind, we can affirm that everything has been put in place to achieve this goal. We believe that the 2025 nuisance mosquito program has improved the quality of life for the residents of Kanata North Ward.

The entire GDG Environment team sends you its sincere regards.

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