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2/26/08

MEMORANDUM

TO: Environmental Concerns Committee

FROM: David P. Gorman, PE, Acting Director of Public Works *DPG*

SUBJECT: Mosquito Control Contract

DATE: January 29, 2008

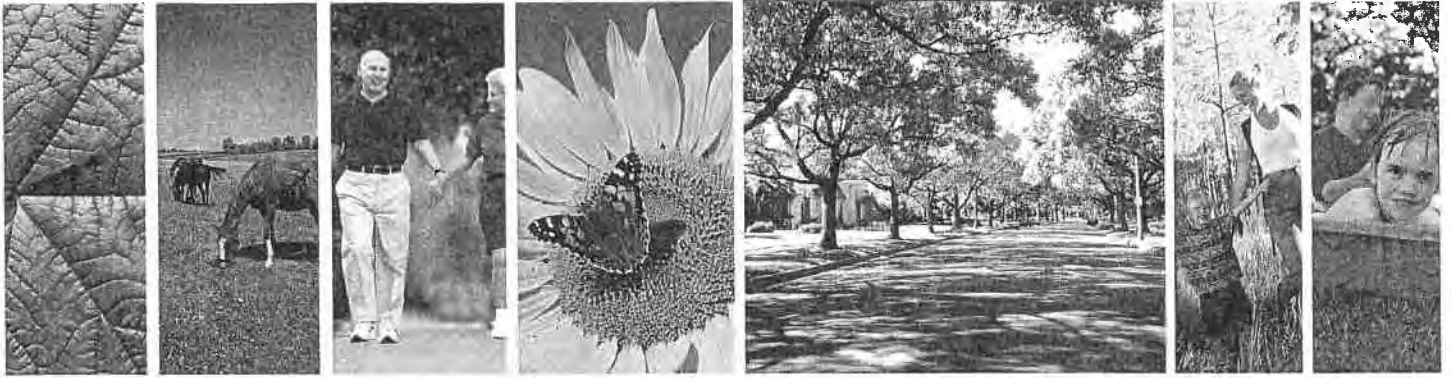
Staff requests that the Environmental Concerns Committee provide a recommendation to the Village Board to accept a contract with Clarke Mosquito Control for calendar year 2008, with a renewal option for 2009. Clark proposes to hold their price for 2008 at the 2007 amount of \$88,710, and increase it for 2010 by the Consumer Price Index. The following services would remain unchanged:

- Larval site monitoring and larvicide application for 146 sites
- Four 30-day larvicide applications in 4,314 catch basins
- One 100-day larvicide application in 350 backyard catch basins (up from 293 in 2006)
- Three pre-hatch applications by helicopter of 49 acres of standing water sites.

Clarke's annual report is attached for your review. As stated in the report, last summer was particularly bad for floodwater mosquitoes (e.g. *Aedes vexans*) due to heavy and frequent rainfalls. Such mosquitoes are pesty but they do not carry the West Nile virus (WNV). Pre-hatch treatments were required through October for the WNV-carrying *Culex* mosquitoes due to the warmer than normal weather.

DG:dg H:\PW\Deputy Director\Mosquito Control\ECC Memo Feb 08.doc

Annual Report



GLOBAL SOLUTIONS FOR MOSQUITO CONTROL

Village of Lombard





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Clarke Environmental Mosquito Management

2007 Annual Report

At Clarke Mosquito Control, our focus is controlling nuisance mosquitoes, reducing the threat of mosquito-borne disease and in doing our part to ensure a comfortable and healthy community.

The Environmental Mosquito Management™ (EMM) process is the core of our integrated pest management philosophy. This process places emphasis on surveying and mapping potential breeding sites, surveillance and monitoring of adult mosquito populations and the use of the Targeted Mosquito Management System™. This larval management system provides inspection of potential and historical larval breeding sites and treatment with biological control agents (including mosquitofish, VectoBac® and VectoLex®) whenever possible. In addition, the Targeted Mosquito Management System advocates the careful and strategic use of products labeled and registered by the U.S. Environmental Protection Agency for mosquito control. As our surveillance identifies a real and present threat of mosquito-borne disease or a pervasive population of nuisance mosquitoes, we treat adult mosquitoes using the latest technology and minimally intrusive products.

Each year, we add to our expertise by reviewing the treatment programs of our clients to provide key learnings for future mosquito control programs. This document will provide an overview of key data used in area surveillance, a recap of the mosquito control season, and a complete summary of services rendered.



Seasonal Overview

Although the Illinois mosquito season began earlier than usual with reports of West Nile due to the 11th warmest spring, (March through May) viral activity was not as high when compared to 2006 statistics. In 2007 we experienced precipitation levels of 149% above normal. In fact, the frequency with which rain had fallen, 43 days, led to the 9th wettest summer with a total of 15.85 inches as recorded at the official O'Hare weather station. These conditions supported excessive breeding of nuisance floodwater mosquitoes, *Aedes vexans*. *Aedes vexans* are known for their voracious biting and are known to persist through October with warmer temperatures.

As the August flooded areas started to stagnant, *Culex* mosquitoes began to breed with the continued warm weather. These conditions led to the late-season transmission of West Nile virus in the Chicago area. Warm weather that continued through October prolonged West Nile well into the fall season.

This year's statistics to-date are:

- 96 human cases
- 4 fatalities
- 46 counties reporting West Nile activity (human/bird/horse/mosquitoes)
- 39 positive birds
- 1,462 positive mosquito batches
- 5 positive horses and other animals

Specifically, in the below listed counties, these are the West Nile virus statistics as of November 15, 2007, according to the Illinois Department of Public Health¹.

County	Human	American Crow	Blue Jay	Other Birds	Mosquito Batches	Horse
Cook	31	4	1	1	1166	0
DeKalb	0	1	0	0	0	0
DuPage	10	0	0	1	153	0
Kane	13	2	0	0	12	0
Lake	4	0	1	0	18	0
McHenry	5	0	1	0	1	1
Will	3	0	0	0	2	0
Ill. Totals	96	25	7	7	1462	5

¹ Illinois Department of Public Health, November 15, 2007
http://www.idph.state.il.us/envhealth/wnvsurveillance_data_07.htm



About West Nile Virus

West Nile virus is primarily a mosquito-borne disease, which can cause West Nile encephalitis (swelling of the brain) and West Nile fever in humans. Though the majority of humans infected will not show symptoms, those who develop West Nile virus risk debilitating effects and possibly death. While the most severe cases and the highest risk of West Nile occur traditionally in people over 50 years of age or with compromised immune systems, all people who spend time outside are at risk of contracting the virus. The disease also affects birds, horses and other animals, with higher mortality rates.

West Nile Virus has spread rapidly across North America since it was discovered in the Western hemisphere, reports the U.S. Geological Survey. West Nile Virus swept from the New York City region in 1999 to almost all of the continental U.S., seven Canadian provinces and throughout Mexico and parts of the Caribbean by 2004. Of those infected, one in five will develop symptoms.

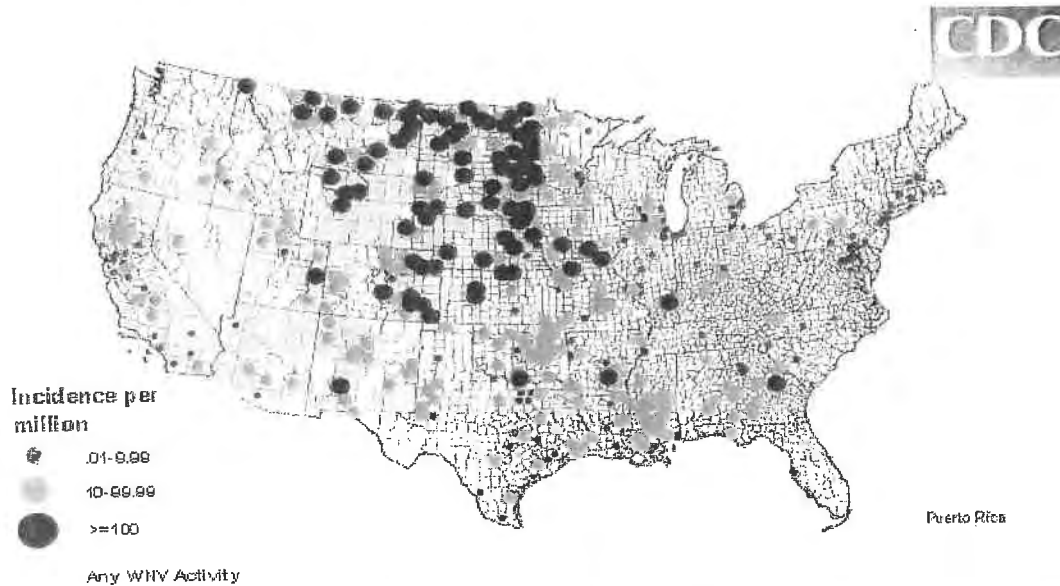
West Nile in the United States 2007

West Nile Virus, now endemic to the entire continental United States, showed considerable activity this year, with highest levels of concentrations in Colorado (555 cases), California (371 cases), North Dakota (361 cases) and South Dakota (207 cases). Surrounding states Nebraska, Wyoming, Montana and Idaho, as well as gulf states Texas and Mississippi, also demonstrated significant areas of concentration.

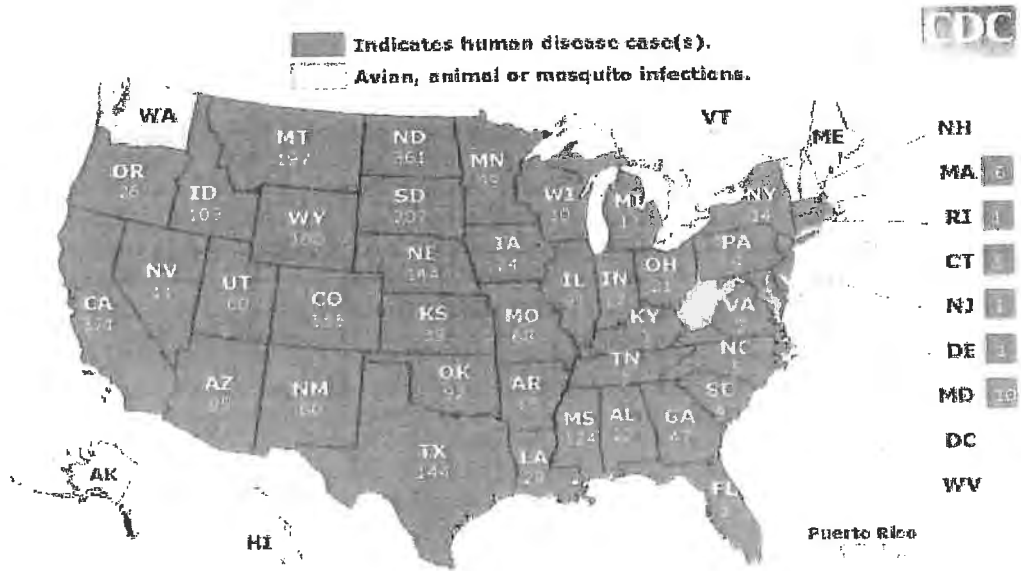
Illinois remained an active state for West Nile in 2007, though it dropped from having the 5th largest number of cases in 2006 to having the 12th largest number of cases in 2007.



2007 West Nile Virus Human Neuroinvasive Disease (Reported to CDC as of November 13, 2007)



2007 West Nile Virus Activity in the United States (Reported to CDC as of November 13, 2007)





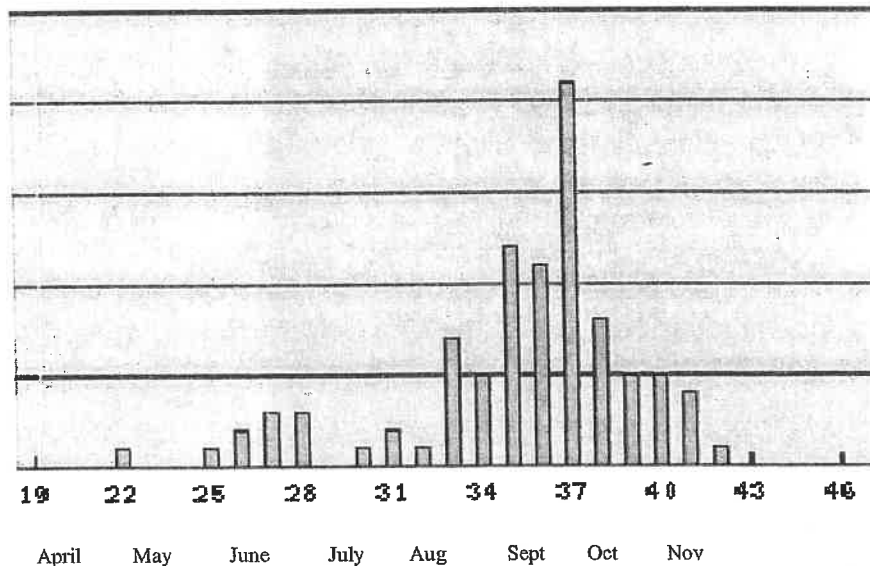
West Nile in Illinois 2007

Illinois first identified West Nile virus this year on May 8, 2007, with positive mosquito batches in DuPage County.

On June 15, the first human case of West Nile virus was reported in DuPage County. Despite the first human case being reported earlier than usual, the traditional spike and decline of cases occurred later in the season, reaching a peak in September, compared to 2005 and 2006 when the peak reached its high point in August.

In total, the concentration of West Nile virus cases was focused on Cook, Kane and DuPage counties, comprising 56 of the state's 96 cases (as of November 15, 2007).

2007 West Nile Virus
Illinois Human Disease Cases By Week
(Reported to CDC as of November 13, 2007)



Since 2002, West Nile virus has been endemic to Illinois, and experts predict that it will remain in the area for a significant number of years. A combination of weather conditions can impact the overall success of virus transmission, including drought conditions or periods of prolonged high temperatures.

This year, Illinois experienced above average precipitation during the summer with average temperatures which led to large broods of annoyance mosquitoes.



West Nile in Illinois cont'd

However, the season started with significant rainfall and earlier than usual reports of West Nile presence in Illinois. On July 16, George Balis, an entomologist with Clarke Mosquito Control, stated:

“With significant rainfall in the past two weeks – several inches in some areas – and predicted temperatures in the 80s and 90s next week, this could be prime conditions for mosquitoes to emerge.”

Nationwide, nearly four times as many cases had been reported as of July 25, 2007, compared to the same date in 2006, setting the nation on pace to have its worst West Nile season in several years. Dr. Lyle Petersen, director of the division of vector-borne infections at the Centers for Disease Control and Prevention, stated that he felt the worst was yet to come:

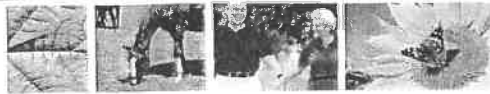
“It's certainly a warning sign that we need to be extremely vigilant,” Petersen said on July 25.

In the City of Chicago and other locations in the Chicagoland area, West Nile virus surveillance showed a dramatic increase in positive mosquito sampling. As a result, the City of Chicago stepped up its efforts to kill adult mosquitoes with ULV truck sprayings.

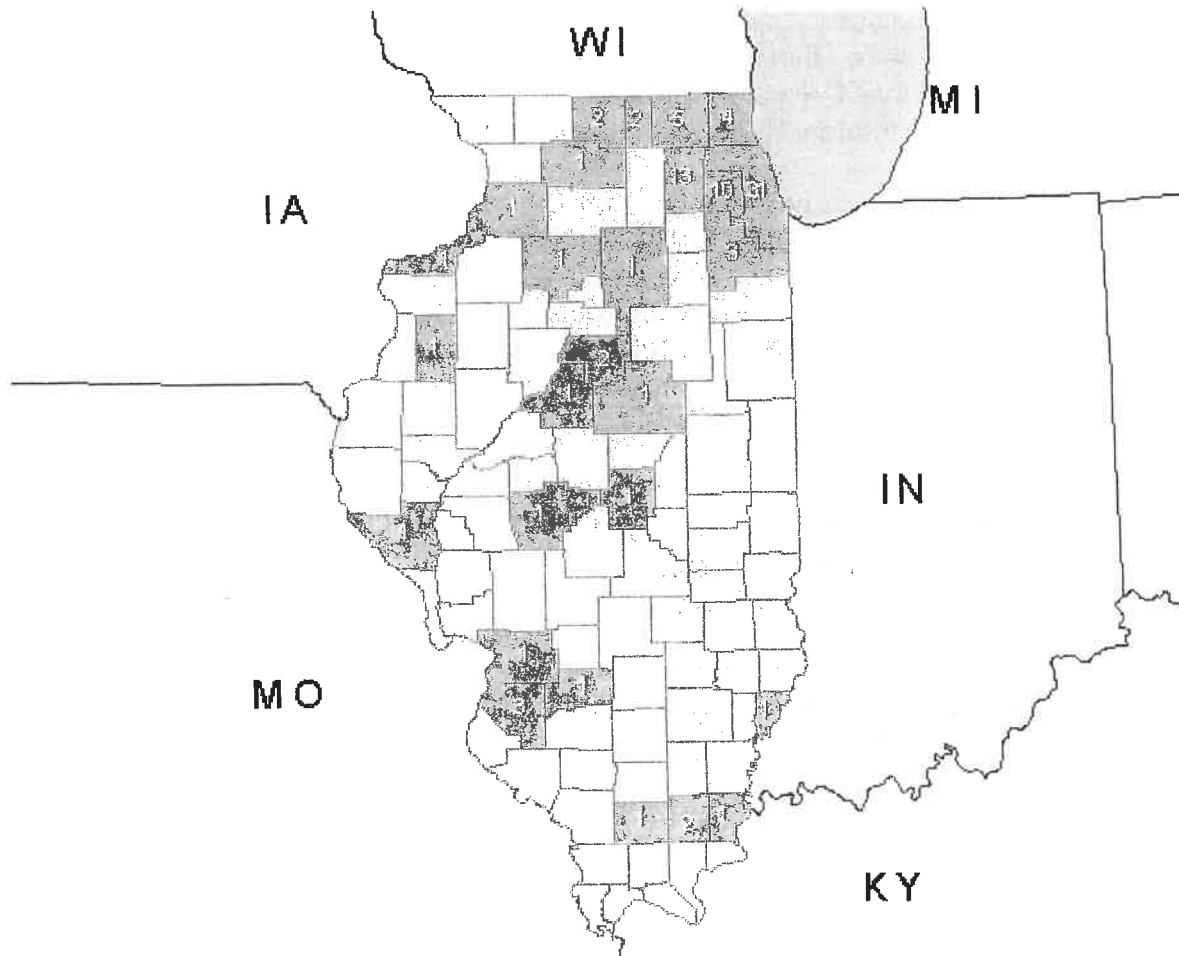
“Both from what we're seeing in our mosquito traps and from the emerging cases of serious human illness, it is clear that West Nile virus is starting to surge and threaten human health in the city,” said Terry Mason, Chicago Department of Public Health Commissioner, on August 20. “We are taking quick and decisive action to protect the public health.”

Although the flooding in northeastern Illinois during early September produced floodwater mosquitoes that typically don't carry West Nile virus, Dr. Eric E. Whitaker, director of the Illinois Department of Public Health, reminded people in flooded areas of Illinois and elsewhere throughout the state to continue to protect themselves against the common house mosquito, which does carry West Nile virus.

Warm weather that continued through October prolonged the threat of West Nile and continued annoyance mosquitoes well into the fall season. Twelve additional cases were confirmed in Illinois during the first week of October alone, bringing the total number of counties reporting the disease to 46.



2007 West Nile Virus
Human Cases Reported in Illinois
(Reported as of November 13, 2007)



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² U.S. Centers for Disease Control and Prevention, November 13, 2007
http://diseasemaps.usgs.gov/wnv_il_human.html



Climatology and Mosquito Overview

Weather has a huge impact on mosquito populations – rainfall determines if floodwater mosquito eggs will hatch, fierce storm can wash away egg rafts and variations in temperature can affect mosquito activity and larval development.

This summer was considered the 9th wettest summer in 137 years. There were 26 thunderstorm days versus 15 in a normal season; 43 measurable rain days versus 29 in a normal season and five 1" + calendar day rains versus 3 in a normal season. June through August rainfall totaled 15.85" which is nearly 50% more rain than usual.

This created a unique environmental situation where we experienced an unprecedented number of floodwater mosquitoes (*Aedes vexans*) emerging over a six week period. *Aedes vexans* is one of the most widespread pest mosquitoes in the world. Adult activity persists through September and well into October, when autumn temperatures remain warm. The average life span of adult *Aedes vexans* in nature is three to six weeks *Aedes vexans* has also been implicated in the transmission of several important diseases including St. Louis encephalitis and dog heartworm.

In addition, as flooded areas started to stagnant, *Culex* mosquitoes began to breed with the continued warm weather. These conditions led to the late-season transmission of West Nile virus in the Chicagoland area.

Warm weather that continued through October prolonged West Nile and nuisance mosquitoes well into the fall season.

Heavy nuisance populations as well as late season increases in *Culex* populations have not occurred since 2001. The 2001 season will be remembered not for nuisance mosquitoes but rather as the year West Nile virus was introduced to Illinois.

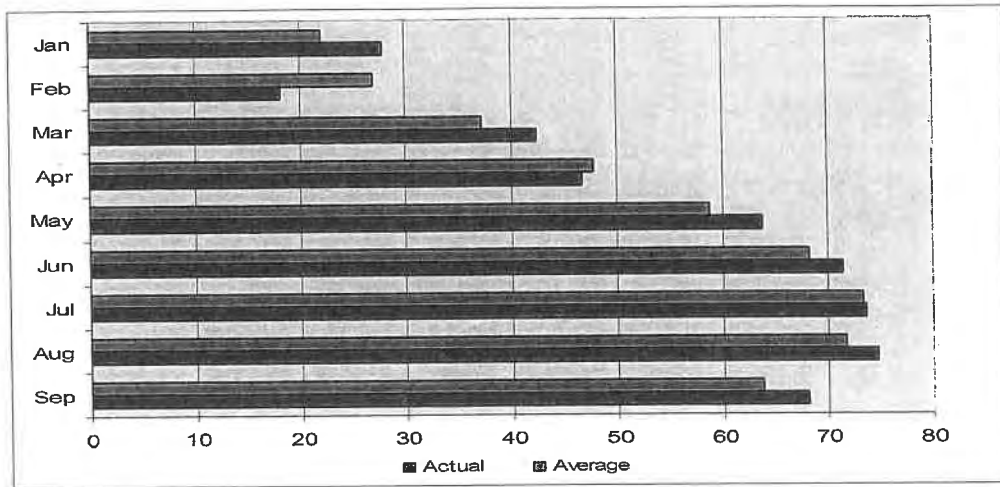
* see attached graphs



2007 O'Hare International Airport (Chicago) Weather Survey

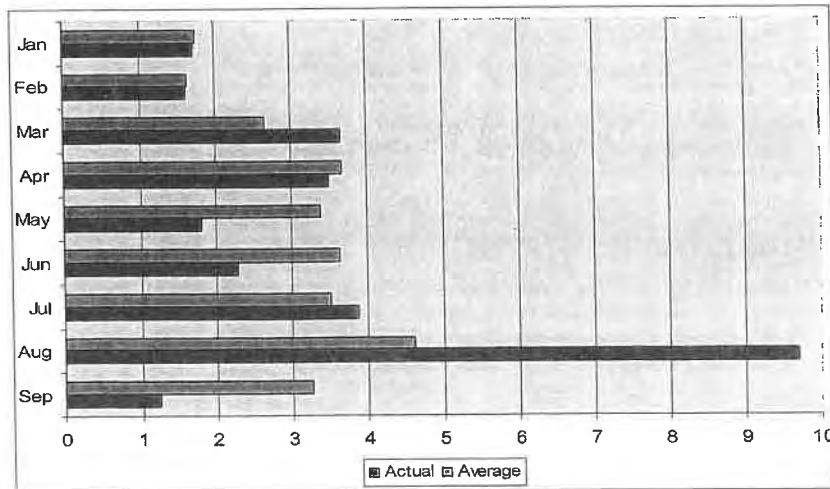
Temperature (degrees Fahrenheit)

	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan
Actual	68.1	74.8	73.7	71.4	63.8	46.8	42.5	18	27.9
Average	63.8	71.7	73.3	68.2	58.7	47.8	37.3	27	22



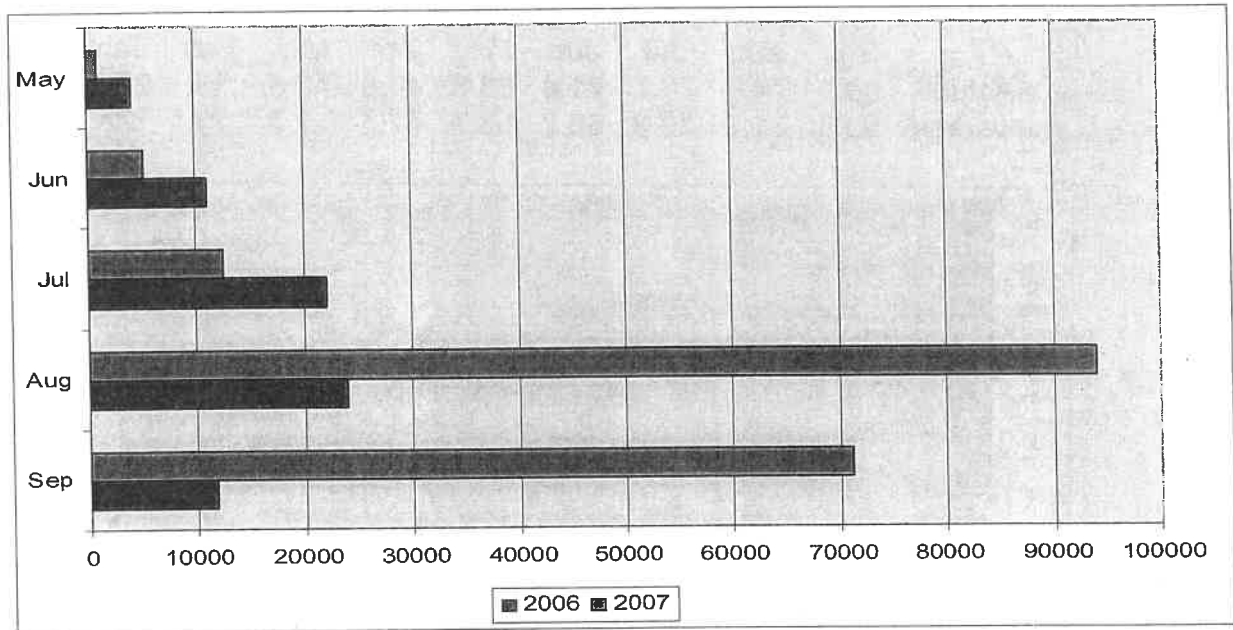
Precipitation (inches)

	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan
Actual	1.23	9.7	3.86	2.29	1.8	3.49	3.66	1.61	1.72
Average	3.27	4.62	3.51	3.63	3.38	3.68	2.65	1.63	1.75

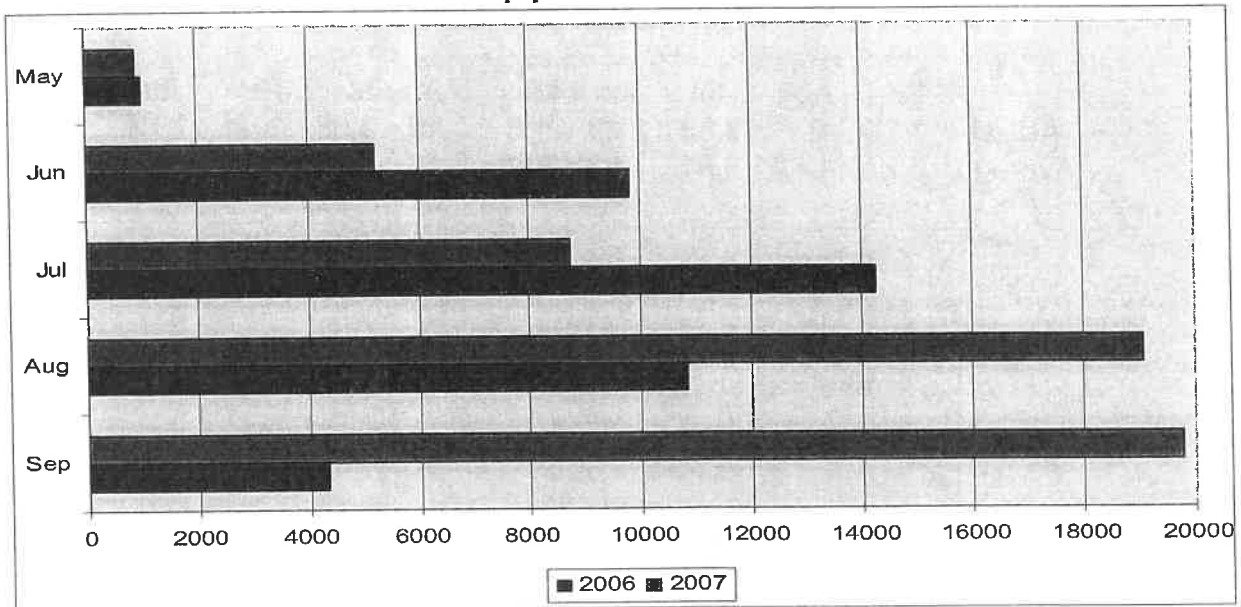




2007 Mosquito Light Trap Network Target Species Comparison *Aedes vexans*



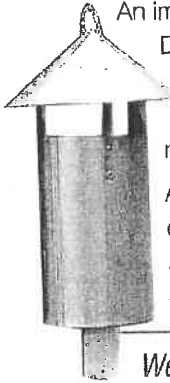
Culex pipiens and restuans





Surveillance Network

New Jersey Light Trap Network



An important supplement to any mosquito control program is a New Jersey Light Trap. Developed in the 1930s, the trap helps determine species diversity and monitors mosquito populations. These traps are located in residential areas and are operated between dusk and dawn (the peak activity period for many species) and should be maintained each year to identify historic and habitual mosquito sites.

A 25-watt bulb in the trap attracts mosquitoes, which are drawn into the trap via an electric fan. Data generated by the trap catches serve several purposes: it confirms the arrival of predicted floodwater mosquito migrations, reflects the effectiveness of mosquito control efforts and identifies fluctuations in adult mosquito populations.

West Nile Virus Surveillance Trap

A vital tool in adult mosquito and arbovirus surveillance is the West Nile virus, or gravid, trap. Developed by the Centers for Disease Control and Surveillance, the trap primarily collects gravid (*Culex*) mosquitoes (principal vectors of West Nile virus), which makes it particularly effective in tracking the disease. A gravid female mosquito has taken a blood meal and is ready to lay her eggs. Typically, (*Culex*) mosquitoes search for water rich in organic material to lay their eggs. If they've obtained their blood meal from an infected animal, they can transmit the virus to their eggs. The mosquitoes are captured live, which allows us to test them for arboviruses and get an early indicator that the virus is present in the area.



Centers for Disease Control and Prevention (CDC) Trap



Mosquitoes looking for a blood meal are mainly attracted by carbon dioxide, exhaled by humans and animals. The CDC trap provides carbon dioxide as bait, though dry ice (frozen carbon dioxide), and a light source to attract female mosquitoes. This trap is set out at prime activity hours for the species targeted. A fan draws mosquitoes into a net and the live mosquitoes are trapped for arbovirus testing. CDC traps often show a very high species diversity and large overall mosquito numbers, indicating the presence of a mosquito-borne virus and relative indices of adult mosquito species.



Light Trap Species Summary

The following table summarizes the species composition from the light trap network operating in Northern Illinois.

Light Trap Species Summary				
<i>Species</i>	<i>Females</i>	<i>Percent</i>	<i>Males</i>	<i>Percent</i>
<i>Ae cinereus</i>	3	0.0%	0	0.0%
<i>Ae species</i>	573	0.2%	238	0.2%
<i>Ae vexans</i>	186243	53.9%	30039	20.9%
<i>An punctipennis</i>	4453	1.3%	943	0.7%
<i>An quadrimaculatus</i>	12028	3.5%	1605	1.1%
<i>An species</i>	17	0.0%	8	0.0%
<i>Cq perturbans</i>	756	0.2%	8	0.0%
<i>Cs inornata</i>	611	0.2%	416	0.3%
<i>Cs species</i>	17	0.0%	10	0.0%
<i>Cx erraticus</i>	484	0.1%	61	0.0%
<i>Cx pipiens</i>	16622	4.8%	2564	1.8%
<i>Cx restuans</i>	8702	2.5%	2854	2.0%
<i>Cx salinarius</i>	440	0.1%	118	0.1%
<i>Cx species</i>	28769	8.3%	45148	31.4%
<i>Cx tarsalis</i>	311	0.1%	45	0.0%
<i>Cx territans</i>	2233	0.6%	611	0.4%
<i>Mosquito, Misc.</i>	5310	1.5%	803	0.6%
<i>Oc canadensis</i>	117	0.0%	37	0.0%
<i>Oc excrucians</i>	14	0.0%	27	0.0%
<i>Oc grossbecki</i>	50	0.0%	0	0.0%
<i>Oc sollicitans</i>	2	0.0%	0	0.0%
<i>Oc stimulans</i>	6297	1.8%	691	0.5%
<i>Oc triseriatus</i>	491	0.1%	134	0.1%
<i>Oc trivittatus</i>	23147	6.7%	933	0.6%
<i>Oc. species</i>	44958	13.0%	54982	38.3%
<i>Or signifera</i>	37	0.0%	2	0.0%
<i>Ps ciliata</i>	11	0.0%	0	0.0%
<i>Ps columbiae</i>	5	0.0%	0	0.0%
<i>Ps ferox</i>	1268	0.4%	1	0.0%
<i>Ur sapphirina</i>	1598	0.5%	1315	0.9%
Total	345,567	100.0%	143,593	100.0%

Total Number of Trap:130
 Total Number of Trap Nights:60

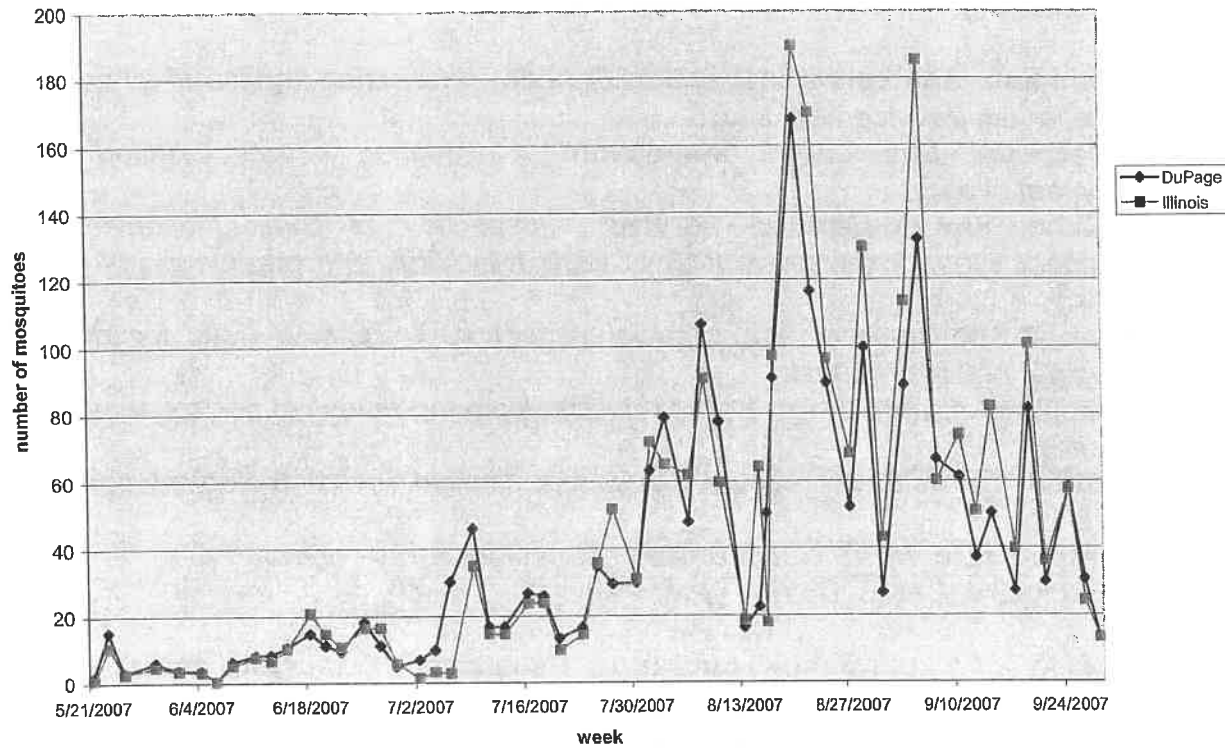
Average Number of Females/Trap Night:44.51
 Number of Trap Malfunctions: 41

Total Number of Mosquitoes: 489,160



Light Trap Counts by Region, County and Community

Light Trap Comparison Chart





Operations and Surveillance Reports

Appendix A

Attached is a report outlining all services performed year-to-date. These services could include the following:

- **1252 Complete Site Larval Inspection Service:** *Inspection service of all potential mosquito larvae development sites.*
- **1302 Targeted Site Larval Inspection:** *Inspection of all targeted larval development sites.*
- **1305 Culex Site Inspection Service:** *Inspection of culex mosquito larval development sites for the prevention of West Nile Virus and other mosquito-borne diseases.*
- **1352 Larval Site Service Call:** *Special inspection of standing water for mosquito breeding per hot line request.*
- **1752 Backpack Larviciding:** *Backpack larviciding for biological control of mosquito larvae sites.*
- **1754 Hand Larviciding:** *Hand equipment larviciding for biological control of mosquito larvae.*
- **2002 Catch Basin Trmt:** *Catch Basin treatment for larval control.*
- **2104 Backyard Catch Basin Trmt:** *Backyard catch basin treatment for larval control.*
- **2107 Backyard Catch Basin Touch-Up:** *Treatment of a backyard catch basin per the request of the community's resident.*
- **2202 Helicopter Prehatch Appl:** *Helicopter prehatch application for larval control.*
- **2402 Helicopter Larviciding:** *Helicopter larvicide application for biological control of mosquito larvae.*
- **2786 ULV Festival Touch-Up Appl:** *Truck ULV "touch-up" application with Anvil for community festival mosquito control.*
- **2802 Truck ULV Appl:** *Truck ULV application for adult mosquito control.*

**SERVICES PERFORMED YEAR-TO-DATE****Appendix B**

SI No	Description	Start Date	End Date
1252	Complete Site Larval Inspection	6/21/2007	6/26/2007
1252	Complete Site Larval Inspection	7/18/2007	7/24/2007
1252	Complete Site Larval Inspection	8/10/2007	8/14/2007
1302	Targeted Site Larval Inspection	5/22/2007	5/23/2007
1302	Targeted Site Larval Inspection	6/6/2007	6/6/2007
1302	Targeted Site Larval Inspection	7/2/2007	7/2/2007
1302	Targeted Site Larval Inspection	7/12/2007	7/12/2007
1302	Targeted Site Larval Inspection	7/31/2007	8/1/2007
1302	Targeted Site Larval Inspection	8/31/2007	9/1/2007
1305	Culex Site Larval Inspection	9/17/2007	9/18/2007
1305	Culex Site Larval Inspection	9/27/2007	9/27/2007
1305	Culex Site Larval Inspection	10/2/2007	10/3/2007
1352	Larval Site Service Call	5/15/2007	5/15/2007
1352	Larval Site Service Call	6/6/2007	6/6/2007
1352	Larval Site Service Call	6/12/2007	6/12/2007
1352	Larval Site Service Call	8/20/2007	8/20/2007
1352	Larval Site Service Call	9/15/2007	9/15/2007
1752	Backpack Larvicide Treatment	6/7/2007	6/7/2007
1752	Backpack Larvicide Treatment	6/8/2007	6/8/2007
1752	Backpack Larvicide Treatment	6/22/2007	6/22/2007
1752	Backpack Larvicide Treatment	6/25/2007	6/25/2007
1752	Backpack Larvicide Treatment	7/12/2007	7/12/2007
1752	Backpack Larvicide Treatment	7/16/2007	7/16/2007
1752	Backpack Larvicide Treatment	8/1/2007	8/1/2007
1752	Backpack Larvicide Treatment	8/2/2007	8/2/2007
1752	Backpack Larvicide Treatment	8/15/2007	8/15/2007
1752	Backpack Larvicide Treatment	9/13/2007	9/13/2007
1752	Backpack Larvicide Treatment	9/19/2007	9/19/2007
1752	Backpack Larvicide Treatment	9/27/2007	9/27/2007
1752	Backpack Larvicide Treatment	9/28/2007	9/28/2007
1752	Backpack Larvicide Treatment	10/5/2007	10/5/2007
1754	Hand Larvicide Treatment	5/22/2007	5/23/2007
1754	Hand Larvicide Treatment	6/6/2007	6/6/2007
1754	Hand Larvicide Treatment	6/21/2007	6/26/2007
1754	Hand Larvicide Treatment	7/18/2007	7/24/2007
1754	Hand Larvicide Treatment	8/10/2007	8/14/2007
1754	Hand Larvicide Treatment	9/17/2007	9/18/2007



1754	Hand Larvicide Treatment	10/2/2007	10/3/2007
2002	Catchbasin Treatment	6/8/2007	6/12/2007
2002	Catchbasin Treatment	7/13/2007	7/13/2007
2002	Catchbasin Treatment	8/10/2007	8/13/2007
2002	Catchbasin Treatment	8/30/2007	8/30/2007
2002	Catchbasin Treatment	9/11/2007	9/12/2007
2104	Backyard Catchbasin Treatment	5/4/2007	5/8/2007
2104	Backyard Catchbasin Treatment	6/11/2007	6/11/2007
2107	Backyard CB Service Call	6/26/2007	6/26/2007
2107	Backyard CB Service Call	7/10/2007	7/10/2007
2107	Backyard CB Service Call	6/15/2007	7/11/2007
2202	Helicopter Prehatch Appl.	5/8/2007	5/8/2007
2202	Helicopter Prehatch Appl.	6/18/2007	6/25/2007
2202	Helicopter Prehatch Appl.	8/2/2007	8/2/2007
2752	Truck ULV Appl.	6/29/2007	6/29/2007
2752	Truck ULV Appl.	7/2/2007	7/2/2007
2802	Truck ULV Appl. (3.1 oz @ 12.5 MPH)	8/30/2007	8/30/2007

SERVICES INVOICED PER CONTRACT:

Services invoiced Year-to-Date: \$91,700.00