

THE COMMONWEALTH OF MASSACHUSETTS  
STATE RECLAMATION & MOSQUITO CONTROL BOARD

# CENTRAL MASSACHUSETTS MOSQUITO CONTROL PROJECT

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[www.cmmcp.org](http://www.cmmcp.org)



## ANNUAL REPORT 2009



## PREFACE

The 2009 Annual Report of the Central Massachusetts Mosquito Control Project (the Project) has been prepared to provide the citizens and officials of the member cities and towns with information pertaining to the Project's control procedures and related activities.

As you read through this report you will notice that the Project is committed to an Integrated Pest Management (IPM) program. IPM utilizes a variety of control techniques and evaluation procedures. All control efforts are undertaken only after surveillance data has been collected and analyzed. This allows control decisions to be made based on the exact need that exists at each specific site. Environmental considerations are paramount when prescribing various control techniques.

The CMMCP Board of Commission is appointed by the State Reclamation and Mosquito Control Board to represent your community's interest. The Commissioners meet with the Executive Director and Director of Operations on a regular basis to discuss and formulate policies, and to provide their expertise in the operation of the Project. The Commissioners welcome your input, and we encourage you to schedule an appointment to visit our Project headquarters.

Copies of this report are distributed to key officials and departments in our member communities, as well as to the public libraries. We would encourage officials to take time from their busy schedule to read this report. Project personnel are available to answer questions you may have, and to meet with you to discuss out procedures and techniques. The Project's website at [www.cmmcp.org](http://www.cmmcp.org) has extensive information on mosquito control in Central Massachusetts.

The Project's goal is to provide effective and environmentally sound mosquito control, reducing mosquito annoyance and the potential for the transmission of mosquito-borne diseases. Our staff of competent, well-trained employees are known throughout the member communities as individuals who take great pride in their work.

Thank you,

Richard J. Day, Chair  
Board of Commissioners  
Central Massachusetts Mosquito Control Project



Member,  
Northeastern  
Mosquito Control  
Association



Sustaining Member,  
American  
Mosquito Control  
Association



Partner,  
EPA Pesticide  
Environmental  
Stewardship Program



Member,  
New Jersey  
Mosquito Control  
Association

**THE COMMONWEALTH OF MASSACHUSETTS**

State Reclamation & Mosquito Control Board  
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<http://www.mass.gov/agr/mosquito/>

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Mr. Gary Gonyea (DEP)

Mr. Mark Buffone, Executive Director

Ms. Alisha Bouchard - Projects Administrator

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Billerica, Massachusetts

Mr. Paul Mazzuchelli  
Milford, Massachusetts

Dr. Sam Telford  
Shrewsbury, Massachusetts

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**Office Manager**

Ms. Karen Millet  
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LIST OF MEMBER COMMUNITIES - 2009

TOWN

SQUARE MILES

DISTRICT ONE

BILLERICA	25.96
CHELMSFORD	22.70
DRACUT	20.90
LITTLETON	16.60
TEWKSBURY	20.70
WESTFORD	30.60
WILMINGTON	17.12

DISTRICT TWO

ACTON	20.00
AYER	9.00
BOXBOROUGH	10.40
FITCHBURG	27.80
LANCASTER	27.70
LEOMINSTER	28.90
LUNENBURG	26.40
STOW	17.60

DISTRICT THREE

BERLIN	12.90
CLINTON	5.70
HUDSON	11.50
MARLBOROUGH	21.10
NORTHBOROUGH	18.50
SHREWSBURY	20.70
SOUTHBOROUGH	14.10

DISTRICT FOUR

ASHLAND	12.40
HOLLISTON	18.70
HOPEDALE	5.27
HOPKINTON	26.60
MILFORD	14.60
NATICK	15.10
SHERBORN	16.00
WESTBOROUGH	20.50

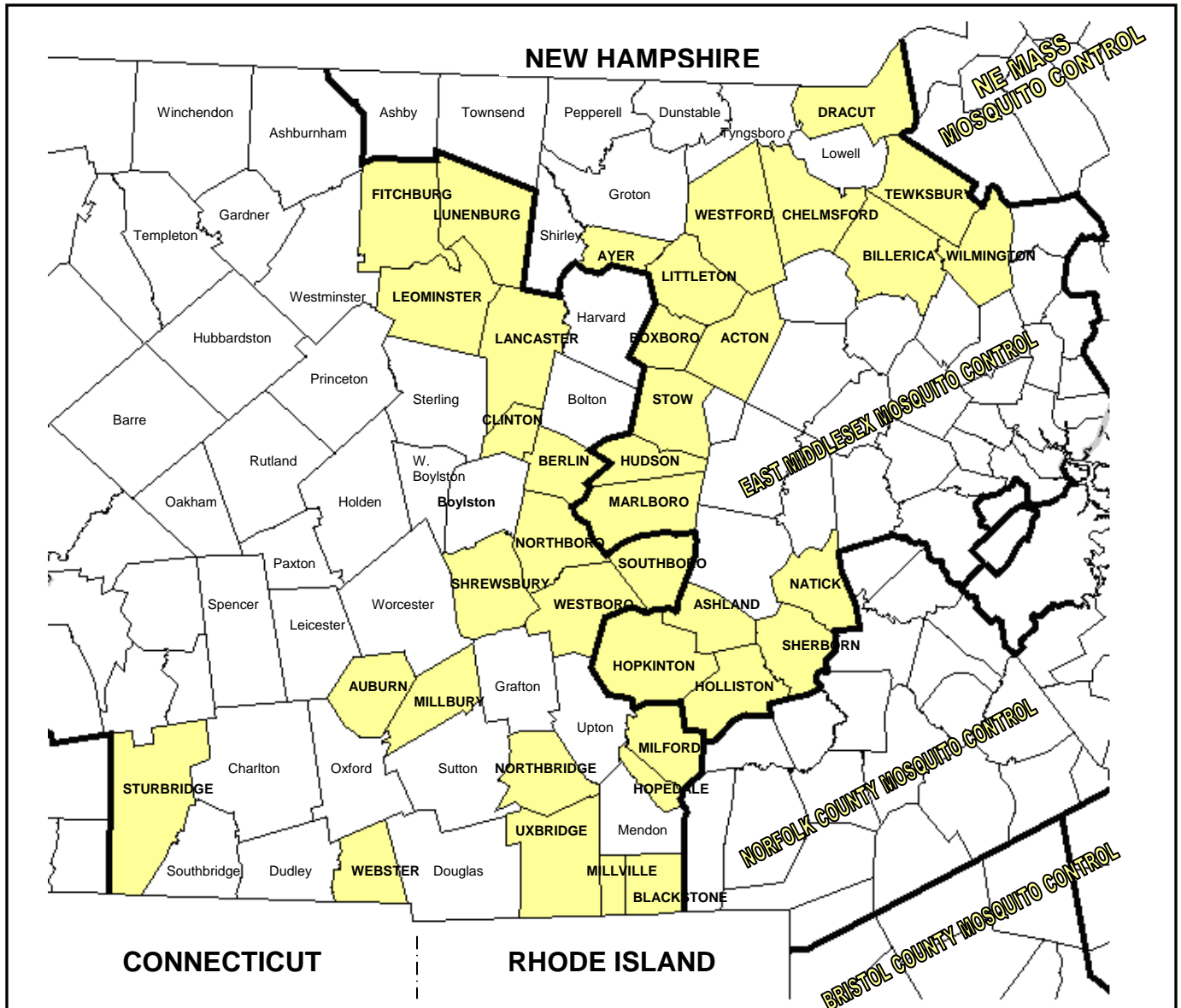
DISTRICT FIVE

AUBURN	15.40
BLACKSTONE	10.90
MILLBURY	15.70
MILLVILLE	4.92
NORTHBRIDGE	17.20
STURBRIDGE	37.40
UXBRIDGE	29.50
WEBSTER	12.50

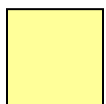
Total Square Miles

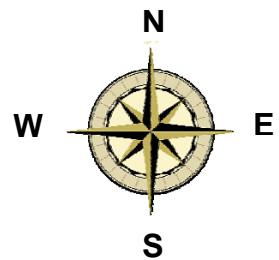
699.57

# CMMCP SERVICE AREA



~ 2009 ~

 = member towns



## MOSQUITO CONTROL ACTIVITIES

One basic fact of the mosquito's biology is the dependence on still, stagnant water to complete its life cycle from egg to adult. Currently, there are two basic control methods practiced by the Project to disrupt this process. The first and most permanent method is called "water management, source reduction or wetlands restoration". This method reduces or eliminates the source of a potential mosquito problem, and consists of cleaning road-side ditches and culverts, removal of brush and accumulated debris from streams, and removal of containers which contain water. All of the above mentioned methods serve to accomplish the same goal - they permit water to flow freely, and reduce the likelihood for stagnant areas, areas in which the mosquito needs to reproduce. Source reduction is practiced year-round, and is done only after extensive examinations, and permission is received by the property owner(s).

There are places where water management is neither practical nor feasible for one reason or another. In these situations, we practice a method called *larviciding*. After a field technician has determined that larval mosquitoes are present, a small amount of environmentally sensitive product is applied to the area according to label directions. This is often a very effective control method, reducing the emergence of the adult mosquito from that area. Larviciding is practiced from late-March to September. Bti is the product of choice for larviciding in wetlands.

A third method is to attempt to control the adult mosquito. The control of adult mosquitoes is done on a request-only basis, and the presence of adult mosquitoes is confirmed before any application is done. Adulticiding can be an effective method of temporary control, which can be beneficial prior to public gatherings, outdoor events and festivals, or when mosquito populations have been determined to be intolerable. Since this part of the program is done **only upon request**, this allows the individual resident to have the ultimate discretion on mosquito spraying in their area - how much or how little. Exemptions for spraying are handled through the City/Town Clerk and the Project office, and are updated each year. Adulticiding is done from approximately Memorial Day to Labor Day, depending on prevalent mosquito populations and the mosquito-borne disease situation.

All products used by the Project have been extensively tested by manufacturers, the US government and mosquito control agencies for many years. They are registered by the EPA and the Mass. Pesticide Bureau. Labels and fact sheets are available upon request to the public from the Project's office, or from our website.

We operate a full surveillance program in our service area. The landing rates performed by our field staff are brought back to the Project lab to be keyed out to species, allowing us to tailor our larviciding program and reduce future dependence on adulticides. We have a mobile team of specialized mosquito traps, called *gravid traps*, designed to capture virus-bearing mosquitoes. These mosquito collections, called *pools*, are sent into the Mass. Dept. of Public Health (MDPH) laboratory in Jamaica Plain for testing of West Nile Virus, Eastern Equine Encephalitis, and other arboviruses of concern by MDPH. These traps are used in a rotation throughout our service area, and are then concentrated in areas showing arboviral activity to supplement MDPH's collection protocols. Additional trap types are utilized in suspect areas to monitor and evaluate the risk of viral transmission to the local populace.

A comprehensive educational program is offered to area schools and civic groups. The program is aimed towards mosquito biology, mosquito habitat, and efforts citizens can undertake to reduce the potential for mosquito populations in their own neighborhood. This program is tailored to suit the requirements of the individual group, from elementary school children, to high school, to adult groups.

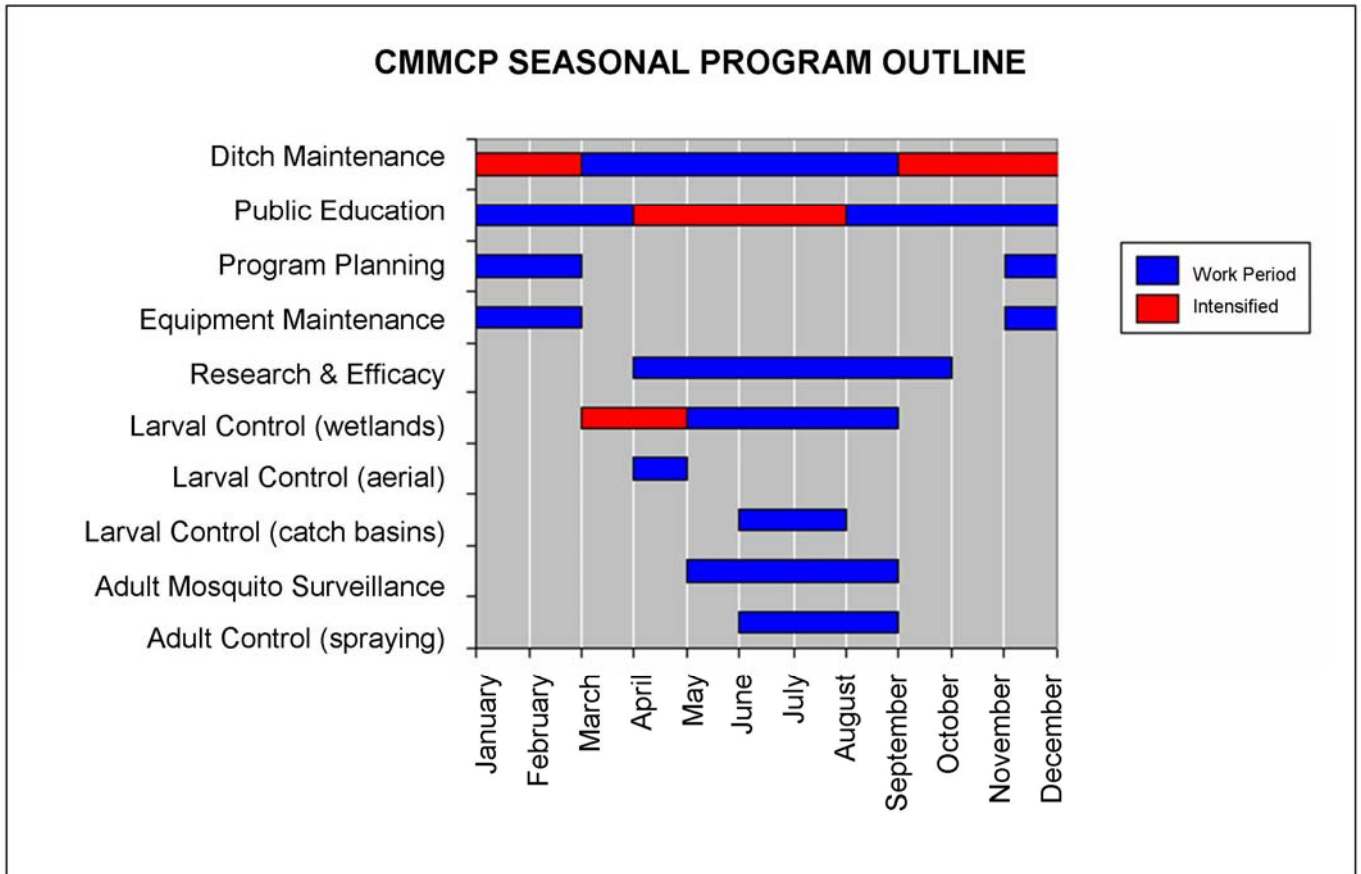
## PROGRAM EVALUATION

This is a part of the program which many people involved directly never see. It must begin with a carefully planned program, one designed so that the data obtained during surveys before treatment and the surveys taken after treatment can be analyzed by statistically sound methods. Only by doing this can the value of a mosquito control program be determined. We will then know what type (species) of mosquito we are dealing with; what the population density is; what method(s) of control provide the most economical and efficient results. Then and only then can we say that we have or have not affected mosquito control on a level that is acceptable to the community.

SEASONAL OUTLINE OF MOSQUITO CONTROL PROGRAM

1. Vehicle and equipment repair and storage - November through March
2. Wetlands Restoration - throughout the year
3. Program Preparation - December through March
4. Map compilation and training - throughout the year
5. Larviciding - May through September
6. Adulticiding - June through September
7. Catch Basin Treatment - May through September

Any mosquito control being done by individual member communities must, by law, be coordinated through the Central Massachusetts Mosquito Control Project.



## SERVICES AND ACTIVITIES

The following services and activities are available to those communities participating in the Central Massachusetts Mosquito Control Project:

### **ADMINISTRATIVE**

1. Assess the need for mosquito control within each of the member communities.
2. Plan and organize a mosquito control program for each member community based on the specific needs of that community.
3. Assist member communities to implement mosquito control programs so as to enable the residents of that community to receive maximum benefits from organized mosquito control.
4. Administer new and coordinate existing mosquito control programs.
5. Collect and maintain accurate records of mosquito populations, ascertain prevalent species, and collate pertinent data for each member community.
6. Cooperate with federal, state and local agencies concerned with vector control programs which may be implemented in the community.
7. Prepare annual reports of Project activities, mosquito population density profiles, recommendations, and any other data requested by the member communities.
8. Provide supervision to staff members and encourage policies which lend themselves to effective and efficient mosquito control.

### **PUBLIC EDUCATION**

1. Inform the general public, as well as professional groups, of the mosquito control activities intended for each member community through news releases, speakers for community and professional organizations, special educational and training programs (including seminars for environmental interest groups), integration of proposed vector control programs with other organizations, agencies and institutions with similar goals.
2. Offer educational programs to the public school system within the member cities and towns. Programs will be aimed toward mosquito biology, mosquito habitat, and efforts which citizens can undertake to reduce mosquito populations in their neighborhoods.
3. Keep the member communities informed of changes and advancements in mosquito control technology and legislation.

## MEDICAL ENTOMOLOGY LABORATORY REPORT, 2009

The mission of the Medical Entomology Laboratory is to refine and maximize the CMMCP's ongoing effort to control mosquitoes. During 2009 Medical Entomology Laboratory personnel carried this mission forward in the following ways.

Medical Entomology Laboratory personnel made 63 educational presentations before 1,986 elementary school students in 15 Elementary schools. The students learned about the life cycle and biology of mosquitoes. They also learned what they could do to control the mosquito population around their own home and how to protect themselves from nuisance mosquitoes.

The laboratory also acquired five additional Modified Reiter Gravid Traps. Modified Reiter Gravid Traps are used to monitor the adult mosquito population for West Nile virus. Modified Reiter Gravid Traps are attractive to the mosquito species thought most likely to have a role in the maintenance and spread of West Nile virus in the United States of America.

CMMCP personnel constructed Resting Boxes to add to the Laboratory's array of mosquito traps. Resting boxes are attractive to *Culiseta melanura* the mosquito species known to play a part in the transmission cycle of Eastern Equine encephalitis. A Resting Box is made from plywood and measures one cubic foot in size. One side of the box is open. The box is painted black on the outside and red on the inside. The black color is attractive to mosquitoes that come to rest inside the box. The red colored interior of the box makes it easier for the collector to see the mosquitoes resting inside the box. One or more boxes are set out in a habitat favored by *Cs. melanura* mosquitoes. When the time comes to check the trap the collector first closes the open end of the box with a Plexiglas cover. Then the collector injects a chemical spray into the box which anesthetizes any adult mosquitoes which have come to rest in the box. The collector vacuums up the adult mosquitoes with a battery operated aspirator and places them in a cooler with cold packs. The mosquitoes are brought back to the laboratory for processing.

During 2009, four interns were employed for the season to operate the mosquito surveillance traps and assist in the identification of mosquitoes. CMMCP staff also participated in the operation of surveillance traps. Using their knowledge of mosquito behavior and the local terrain, these skilled and experienced personnel monitored the adult mosquito population.

CMMCP personnel made and processed 1,565 collections this season. The collections contained 37,230 adult mosquitoes which were identified to species. Twenty-six mosquito species were represented in the collections. Adult mosquitoes of species known to play a role in the transmission of disease were tested for the presence of West Nile virus and Eastern Equine Encephalitis virus.

Thirteen thousand, seven hundred and ninety-one mosquitoes (13,791) were determined to be suitable for virus testing. They were divided into 606 groups or pools. These pools of mosquitoes were tested for West Nile and Eastern Equine virus infection. Three of these pools tested positive for West Nile virus. Three of these pools tested positive for Eastern Equine Encephalitis. The findings are listed below.

The CMMCP increased surveillance of mosquitoes in these areas in response to the positive test results. Mosquito control measures were augmented as well. The data from these collections was shared with the Massachusetts Department of Public Health. The surveillance indicates that these pathogens were circulating in the local environment during 2009.

Modern, scientifically based mosquito control has many facets. These include public education, surveillance, water management and control of immature and adult mosquitoes. Medical Entomology Laboratory personnel are committed to advancing all facets of mosquito control. Such a commitment will further enable the Central Massachusetts Mosquito Control Project to provide its member communities with quality mosquito control.

Respectfully submitted,  
 Curtis R. Best, Staff Entomologist

Collection Date	Species	Town	Test Type	Result
8/4/2009	<i>Culex species</i>	Westborough	WNV	Positive
8/6/2009	<i>Culex species</i>	Westford	WNV	Positive
9/2/2009	<i>Culex species</i>	Shrewsbury	WNV	Positive
9/22/2009	<i>Culiseta melanura</i>	Webster	EEE	Positive
9/22/2009	<i>Culiseta melanura</i>	Leominster	EEE	Positive
10/9/2009	<i>Culiseta melanura</i>	Webster	EEE	Positive

WNV Surveillance Summary - <b>Statewide</b>	2009
Mosquito Pools Positive	26
Animals Positive	1
Humans Positive	0
EEE Surveillance Summary - <b>Statewide</b>	2009
Mosquito Pools Positive	54
Animals Positive	3
Humans Positive	0
CMMCP Surveillance Summary	2009
Mosquitoes Collected and Identified	37,230
Mosquito Pools Submitted for testing	606 (13,791 specimens)
Mosquito Pools Positive WNV	3
Animals Positive	0
Humans Positive	0
Mosquito Pools Positive EEE	3
Animals Positive	0
Humans Positive	0

**Central Mass. Mosquito Control Project  
2009 SEASON SUMMARY**

Cumulative Surveillance Summary

Target Species	Ae. vex	Cq. per	Cs. mel	Oc. can	Culex	All Species
No. Pools	136	269	355	180	888	3786
Total Specimens	836	10578	2114	852	13980	37274
No. Pools WNV +	0	0	0	0	3*	3*
No. Pools EEE +	0	0	3*	0	0	3*

- \*Pool of WNV+ Culex Species collected in Westborough on 8/4/09
- \*Pool of WNV+ Culex Species collected in Westford on 8/6/09
- \*Pool of WNV+ Culex Species collected in Shrewsbury on 9/2/09
- \*Pool of EEE+ Culiseta melanura collected in Webster on 9/22/09
- \*Pool of EEE+ Culiseta melanura collected in Leominster on 9/22/09
- \*Pool of EEE+ Culiseta melanura collected in Webster on 10/9/09

Weather Summary (Northborough, MA): This mosquito season was extremely wet. Statewide monthly rainfall averages were as follows: May-4.04" (CMMCP/Northborough 2.71"); June-5.84" (CMMCP/Northborough 4.2"); July-7.80" (CMMCP/Northborough 12.1"); August-4.15" (CMMCP/Northborough 3.75"); September-2.21" (CMMCP/Northborough 2.41").

**CMMCP 2009 Mosquito Summary-**

Target Species	Δ From Last Year's Final Totals	Predominant Trap Sites
Aedes vexans	-69.86%	Westborough, Dracut
Coquillettidia perturbans	-32.32%	Leominster, Tewksbury, Westborough
Culiseta melanura	+31.06%	Holliston, Boxborough
Ochlerotatus canadensis	-46.82%	Westborough, Hopkinton, Westford
Culex Species	+13.95%	Auburn, Northborough, Leominster
All Species	-7.240%	Leominster, Westford, Westborough

The predominant mosquito species for the 2009 surveillance season was Culex Species (~37.51% of total specimens collected) followed by Coquillettidia perturbans (~28.38% of total specimens collected). 606 pools of mosquitoes comprising 13,791 mosquitoes were sent into Jamaica Plain for testing.

Requests for service, especially adulticiding, showed a 28.5% increase over 2008 with a total of 12,800 calls. All requests for service this year totaled 13,614.

Frank Cornine, Field Biologist  
Tim Deschamps, Executive Director

## FIELD BIOLOGIST REPORT 2009

The Research and Efficacy Department continued many projects during 2009, including the observation for resistance in field collected mosquitoes to ANVIL® 10+10 using bottle assays, and the study of host-seeking activity for several mosquito species in the CMMCP service area. This year the Norfolk County Mosquito Control Project contributed data to the host-seeking activity study. Results from this study were presented during December at the 55<sup>th</sup> Annual Northeastern Mosquito Control Association Meeting, held in Sturbridge, MA. The presentation was well received by those in attendance.

This was the third full, consecutive season of conducting bottle assays for level of resistance in local mosquito populations to ANVIL® 10+10. By introducing mosquitoes into test bottles coated with a baseline concentration of diluted ANVIL® 10+10 we are able to observe to what degree if any, the collected CMMCP service area mosquitoes are developing resistance. Simultaneously conducting bottles without the presence of test product served as a control measure. Again, the observations from these bottle assays did not indicate a need for change in adulticide product at this time.

The host-seeking activity study was continued this season with the addition of collections from the Norfolk County Mosquito Control Project. Using programmable collection devices that segregate collections according to specific time periods, we are able to observe when targeted species are most active. Knowledge of when these species are most active has direct control implications because mosquitoes in flight have the highest probability to contact product, and so are most susceptible to adulticide control measures. Because species have different host-seeking activity behaviors, control methods may have to become more fluid depending on the local population dynamics and virus levels in order to maximize efficacy. Species of interest in this study included *Culex pipiens/restuans* complex, *Culiseta melanura*, *Ochlerotatus canadensis*, *Psorophora ferox*, *Coquillettidia perturbans*, *Aedes vexans*, *Anopheles quadrimaculatus* and *Anopheles punctipennis*.

As in past seasons, weekly mosquito surveillance reports were produced for the CMMCP service area, which included regional species population graphs, virus findings, yearly comparisons, and weather data. These reports were posted on the CMMCP website for residents, state and local officials. These weekly surveillance reports were also distributed to the State Reclamation Board, the Mass. Department of Public Health, and to the CMMCP Board of Commission. The mosquito surveillance program itself was assisted in several ways this past year. Seasonal staff were trained, while equipment and trap sites were maintained. Select mosquito surveillance traps were also set and collected. A seasonal intern assisted in many aspects of the department, including bottle assays and trap deployment, freeing up valuable time for mosquito identification.

Updates and advancements were made to the CMMCP geographic information system (GIS). A GIS layer updates included streets surveyed/treated in the catch basin larvicide program, wetlands treated in the aerial larvicide program, trap site locations from the mosquito surveillance program, and also statewide virus activity. Updates were also made for the NHESP Memorandum layers, with maps created and distributed to the CMMCP Wetlands Coordinator. Several maps were produced for the field technicians including standard town maps for use in the adulticide program, culvert cleaning and reference for catch basin larviciding. Maps were also created for select wetlands restoration jobs to examine the level of mosquito activity through service requests, historic larvicide sites, and virus activity.

Public education was conducted in several different ways. Assistance with the Elementary School presentations occurred in the spring with great success. "Mosquito Control in Central Massachusetts- an Overview," was also presented to a local Rotary club informing them of all aspects of CMMCP. As more public education opportunities arise, efforts will be made to accommodate.

Several training opportunities were taken during this past year, including two webinars presented by the American Mosquito Control Association entitled "What is an integrated mosquito management program," and "Dispelling myths about mosquito control utilizing the media." Training in the packaging and shipping of Division 6.2 materials and dry ice by the National Laboratory Training Network was successfully taken. GIS course "Understanding Map Projections and Coordinate Systems" by ESRI was also completed this year. Retaining current licenses and advancing through educational opportunities will be continued in 2010, with the Research and Efficacy Department also assisting other CMMCP departments.

Respectfully submitted,  
Frank H. Cornine III, Field Biologist

## WETLANDS RESTORATION PROGRAM REPORT 2009

### INTENT AND PURPOSE OF PROGRAM:

Wetland restoration is an important part of the CMMCP's Integrated Pest Management (IPM) plan for mosquito control. The intent of the program is to improve the flow of water in degraded ditch systems through ditch maintenance and restoration projects. These projects will effectively reduce stagnant breeding sites, and can reduce or often eliminate the need for periodic applications of pesticides.

Wetland restoration/water management projects are conducted per the *Massachusetts Best Management Practices and Guidance for Mosquito Control* and the addendum entitled *Mechanical Wetlands Management Activity Post-Monitoring Guidelines*.

Projects are initiated with a phone call from a town resident or town official. Also, a member from the CMMCP staff may identify a site that could benefit from work. Once a site is brought to the attention of CMMCP, the Wetland Project Coordinator performs an assessment of the site. If the site is appropriate for work, a site survey, plan, and notifications are completed.

The site survey includes soil sampling, taking transects and cross sections of the ditch, and determining hydrological conditions. Wetlands are classified and sites are documented in the pre- and post-excavation states through a photographic record. Any historical information on the drainage system is obtained from local residents or town records. The data gathered in the field is used in combination with information acquired from maps and DEP wetland aerial photographs to develop a project site plan. The site plan includes the specifications that the field staff need in order to properly perform the project.

Once the site plan is completed, notification letters and permission slips are sent out to all property owners who would be affected by the project. In addition to the letters sent to property owners, notification letters are sent to DEP, the local conservation commission, and the US Army Corps of Engineers for all mechanized work using a low ground pressure excavator. The notification letter provides the agencies with a 30 day grace period prior to commencement of a project. During this time, the agencies have the opportunity to notify CMMCP of any concerns that they may have with a project. If there are legitimate concerns, a project may be modified, delayed or abandoned. If no issues are brought to the attention of CMMCP within the 30 day period, the project begins as planned.

### SUMMARY OF WORK FOR 2009:

In 2009, 111 sites were assessed by the Wetland Project Coordinator. Of these sites, 34 were visited multiple times to best survey, implement, and monitor water management work at each site. Of the sites, 28 were brought to the attention of the Project through resident requests (25%). Eighteen sites were requested by town officials (16%), and forty-seven were identified by CMMCP staff (42%). Eighteen sites were requested from a combination of residents, officials, and/or CMMCP staff (16%).

Eighty-eight water management jobs were set up and completed, with ongoing maintenance. Twenty-four of these jobs involved the use of the low ground pressure excavator.

In addition to assessing and setting up sites for water management work, the wetland project coordinator's focus included beaver management. Several member communities requested assistance with breaching beaver dams. After the appropriate permits were issued by the local Board of Health and Conservation Commission, work to breach the dams was conducted.

Additional information on our procedures or on specific restoration projects can be acquired by calling the CMMCP office at (508) 393-3055 from 7:00am to 3:30pm.

Respectfully submitted,  
Katrina Proctor, Wetland Project Coordinator

# SATISFACTION SURVEY OF SERVICE REQUESTS IN THE CENTRAL MASSACHUSETTS MOSQUITO CONTROL PROJECT SERVICE AREA – 2009

**TIMOTHY D. DESCHAMPS**, Executive Director  
Central Mass. Mosquito Control Project  
111 Otis Street Northborough, Massachusetts 01532  
(508) 393-3055 • [deschamps@cmmcp.org](mailto:deschamps@cmmcp.org)

## ABSTRACT

Residents of our service area request service from the menu of services offered to them by CMMCP. Requests for adulticiding (spraying) and larval control are the most common forms of service requests we receive. We accept requests for service through a variety of means, primarily by telephone, but increasing more by the online service request form from the CMMCP website. Additional methods include personal visits to our office, phone calls on behalf of residents from town and/or state officials, and direct requests to our field staff. The CMMCP Commission requested a survey of residents who requested service in 2009 to determine if our staff was meeting acceptable levels of customer satisfaction. This is the same survey that was done in 2005, 2007 and 2008. After compiling these results, we find that a majority of residents in our service area were satisfied with our control efforts and methods, which mirrors our results from previous years. We also compared 2009 with the 3 year average to determine if satisfaction levels were comparable.

## SURVEY METHODOLOGY

In 2009 we received 13,614 requests for service, ranging from adulticiding to larval control, a 28% increase in service requests from 2008. 8,012 adulticiding calls were filtered (duplicates removed) and placed into a separate database. Service calls were sorted according to town, and each town was tabulated for total requests received in 2009. These towns were then graphed to show which towns had the most calls. Each town was assigned a percentage according to this data. This percentage would determine the number of postcards sent to each town from the overall total. The CMMCP Commission decided that 1,500 postcards would be a representative sample of the service calls received this year (this is an increase of 500 over the past 3 surveys). The survey was designed to be as easy as possible for residents to access and complete. An online survey was created, and the postcards would include unique identifiers that the residents would use. The postcards contained a blind weblink to the survey so that unauthorized users would not be able to participate in the survey. Information such as how they contacted us, were the office and field staff helpful and informative, how long did they wait for service, was the service provided effective, and their overall satisfaction was measured. This study uses the same methodology as the three previous resident surveys.

## SURVEY FINDINGS

From 1,500 postcards mailed, 306 responses were received (21%). The results are as follows:

### 1). In your most recent experience, how did you contact the Central Mass. Mosquito Control Project?

	Number	Percent
Telephone	146	48.5%
Website	148	49.2%
In person	1	0.3%
Other	6	1.9%
Total	301	

**2). If by telephone or in person at the CMMCP office, were your questions or concerns answered to your satisfaction?**

	Number	Percent
Yes	156	98.7%
No	2	1.2%
Total	158	

**3). If by telephone, did you experience difficulty reaching our staff?**

	Number	Percent
Yes	19	12.1%
No	137	87.8%
Total	156	

**4). If through the website or e-mail, did you find the information you needed in a satisfactory manner?**

	Number	Percent
Yes	169	98.2%
No	3	1.7%
Total	172	

**5). Please give the approximate time you waited for service from your initial request:**

NOTE: 88.5% within a week or less

	Number	Percent
1-3 days	116	38.2%
3-5 days	76	25%
1 week	77	25.3%
2 weeks+	35	11.5%
Total	304	

**6). Did you find our response from your initial request to when you received service within a reasonable amount of time?**

	Number	Percent
Yes	283	94%
No	18	5.9%
Total	301	

**7). When you received service, did our field representative appear knowledgeable and competent about his/her profession?**

	Number	Percent
Yes	255	89.2%
No	31	10.8%
Total	286	

**8). Were your questions and concerns answered by the Technician to your satisfaction?**

	Number	Percent
Yes	252	91.3%
No	24	8.6%
Total	276	

**9). Did you receive any written information (pamphlets, etc.) from our representative?**

	Number	Percent
Yes	205	68.7%
No	93	31.2%
Total	298	

**10). Did you find this information useful?**

	Number	Percent
Yes	189	71.10%
No	14	5.20%
Did not receive	63	23.60%
Total	266	

**11). Did you request service more than once in 2009?**

	Number	Percent
Yes	138	45.5%
No	165	54.4%
Total	303	

**12). If you requested additional service in 2009, was it because the original application was insufficient to meet your needs, or for a later re-treatment or follow up?**

	Number	Percent
Retreatment	119	79.8%
Insufficient	30	20.1%
Total	149	

**13). Would you/did you recommend our service to others in the future?**

	Number	Percent
Yes	296	97.6%
No	7	2.4%
Total	303	

**14). In your opinion, did our application made your area better, worse, or had no effect?**

	Number	Percent
Better	245	81.6%
Worse	0	0%
No Effect	55	18.3%
Total	300	

**15). If you think your area improved, can you give an approximate length of time you experienced relief from mosquito annoyance?**

	Number	Percent
1-2 days	42	17.5%
3-5 days	41	17.1%
1 week	63	26.3%
2 weeks+	93	38.9%
Total	239	

NOTE: 2/3 experienced at least a week of relief, nearly 39% report more than 2 weeks of relief

**16). On average, our services cost \$2.00 – \$4.00 per person each year (withheld from local aid rec'd from the State). In your opinion, is this amount too high, too low, or sufficient?**

	Number	Percent
Sufficient	241	82.5%
Too Low	48	16.4%
Too High	3	1%
Total	292	

**17). In which month or months do you recall receiving service?**

	Number	Percent
June	69	23.2%
July	92	30.9%
August	52	17.5%
More than 1	84	28.2%
Total	297	

**18). Overall, are you happy with the service provided this year by CMMCP?**

	Number	Percent
Yes	276	92%
No	24	8%
Total	300	

**19). Do you plan on using our service again in the future?**

	Number	Percent
Yes	293	98%
No	6	2%
Total	299	

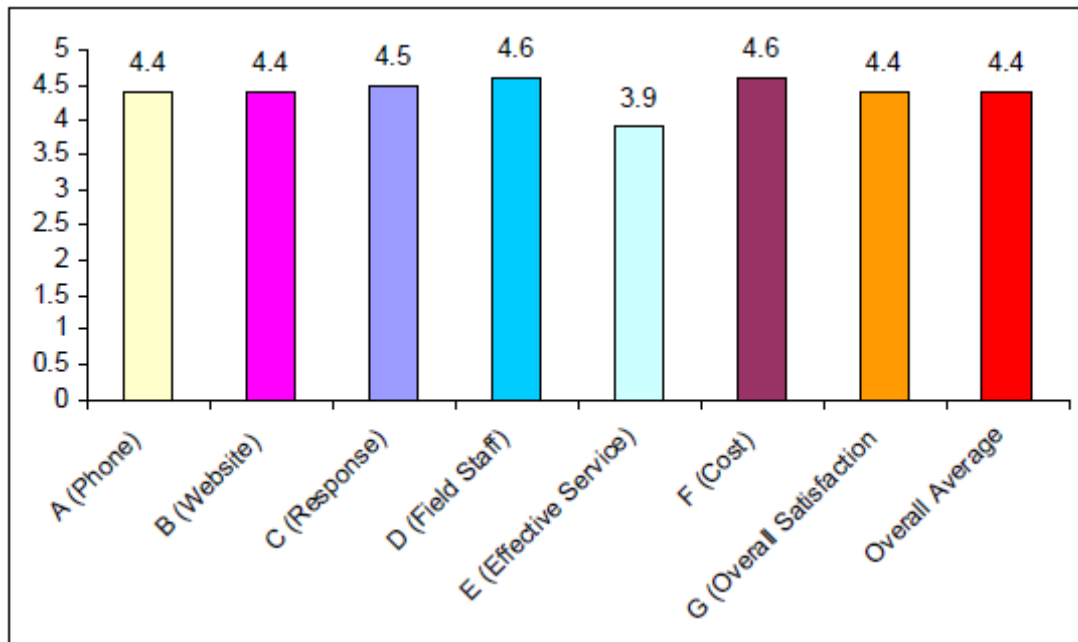
Please rate our performance for 2009 from 0 to 5, where 5 is the best rating, 0 is the worst rating:

QUESTION	POINTS	AVERAGE
The information you received over the phone was informative & helpful	935 points from 1,050 (210 respondents)	4.44 average from 5
The information on our website is easily available and helpful	1,137 points from 1,285 (257 respondents)	4.4 average from 5
The response time for service is reasonable	1,339 points out of 1,485 (297 respondents)	4.5 average from 5
Our field staff that responded is knowledgeable and competent	1,258 points out of 1,370 (274 respondents)	4.6 average from 5
The service provided was effective	1,175 points out of 1,475 (295 respondents)	3.98 average from 5
This service is reasonable compared to the cost	1,342 points out of 1,470 (294 respondents)	4.6 average from 5
Please rate your overall satisfaction with the service received in 2009	1,301 points out of 1,475 (295 respondents)	4.4 average from 5
<b>Total satisfaction rating: 8,487 points out of 9,610 possible – 4.41 average</b>		

## CONCLUSION

Overall satisfaction was 92%, and 98% would use our services again in the future. Answers to question #9 shows a marked increase over past years in regards to residents receiving public relations materials. This survey also documents the increase in website usage to register requests.

Overall this survey shows high satisfaction amongst the respondents, but some ratings were lower slightly than in past surveys. This was due in part to a higher volume of service requests, cooler than average nighttime temperatures in the early part of the spray season, and most notably significant rain events throughout most of the summer that negatively impacted spray operations and contributed to a constant hatch of new mosquito broods.



# **Bottle Assays of Field Collected Mosquitoes for Level of Resistance to ANVIL® 10+10 in Central Massachusetts (Update 2009)**

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## **ABSTRACT**

In 2009, the Central Mass. Mosquito Control Project continued conducting bottle assays, which test the potency of a substance on live specimens, to determine if pesticide resistance has been developing in local mosquito populations. Using procedures recommended by the Center for Disease Control and Prevention, the results of unexposed mosquitoes were compared to those collected from areas serviced by the CMMCP adulticide program. It was determined that the level of resistance in local mosquito populations does not warrant any procedural or insecticide changes at this time. Despite these findings, CMMCP will continue bottle assays of local mosquito populations to monitor the levels of resistance so that if indications of resistance are observed, proper actions could be implemented to ensure control effectiveness.

## **INTRODUCTION**

With environmental changes, mosquito species have the potential to change their current distribution and bring disease with them to new areas (Brogdon 1998; Simsek 2003). These possible diseases include malaria, dengue, yellow fever and Rift Valley Fever among others (McAbee 2003; Simsek 2003). Faced with these new threats, vector control personnel must be aware of the dynamics of local mosquito species in order to lessen the threat of human infections.

Resistance to pesticides can have a major impact on the abilities of public health officials against vector-borne disease (Brogdon 1998). It has been

shown that some past agricultural and pest control use of insecticides has led to the development of resistance of these chemicals in select populations of mosquitoes (Rodriguez 2005). This resistance is predicted to be the basis for future reemergence of vector-borne diseases, and also impair the control efforts in these situations (Brogdon 1998).

There are several factors that may have contributed to this development, including the narrowing scope of insecticides available for public health use, along with increasing restrictions from regulatory agencies (Brogdon 1998). Resistance to pyrethroids in

particular could be due in part to past use of DDT in some areas, with the resistance mechanism being similar for both (Brogdon 1998; McAbee 2003). This cross-resistance, as observed between pyrethroids and DDT, is becoming more prevalent as the existing resistance mechanisms are being enhanced in the target insects (Brogdon 1998).

Despite research that has shown resistance in specific mosquito species, the actual impact of this on vector control is not known due to several issues. One is the lack of information about the current resistance levels, due in part to the wide variety of surveillance programs and data collection efforts. Another factor, and potentially more important, is that resistance seems to be localized. In one study, certain mosquito populations that were only a few kilometers apart varied greatly on the presence and levels of resistance, including the actual mechanism for the resistance (Brogdon 1998).

These unknowns about the level of resistance in vector species have reinforced the need to study pesticide resistance by CMMCP. The goals of this research will be to create baseline data for control efforts, detect early resistance, and to observe the current effects of control strategies (Brogdon 1998). If resistance is observed, then a change in application rates or a change to a different class of insecticides may need to be considered.

To control adult mosquitoes, CMMCP uses ANVIL® 10+10 (Clarke Mosquito Control Products, Inc., Roselle, IL) (EPA Reg. No. 1021-1688-8329), a synthetic pyrethroid composed of 10% SUMITHRIN® (Sumitomo Chemical Company, Ltd., Osaka, Japan)(d-phenothrin) and 10% piperonyl butoxide (PBO)(Center for Disease Control and Prevention 2002; PHEREC 2001), which is used as a synergist<sup>1</sup>. In this ongoing study to monitor resistance levels in its service area, CMMCP continued conducting bottle assays in the summer of 2009 for ANVIL® 10+10.

## METHODS

The bottle assay procedure used by CMMCP was modeled after the CDC method (Center for Disease Control and Prevention 2002), where a baseline for resistance was established using specimens collected from an area without any historical adulticide exposure. This data could then be plotted against data from mosquito populations in areas where CMMCP records show past insecticide usage has occurred. This will determine if any degree of resistance has developed to the current CMMCP adulticide product.

To start, clean 250ml Wheaton bottles (Wheaton Science Products, Millville, NJ) were lined with 1ml of various concentrations of ANVIL® 10+10 (8.868µg/ml, 22.17µg/ml, 44.34µg/ml, and 88.68µg/ml), which

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<sup>1</sup>Synergist- Additional substance that will assist in the elimination of certain resistance mechanisms; PBO synergist eliminates oxidase activity (Center for Disease Control and Prevention 2002).

were diluted with pesticide grade acetone (Thermo Fisher Scientific, Inc., Fair Lawn, NJ). Approximately 10-15 field collected mosquitoes were introduced into each bottle by mechanical aspiration and % knockdown was recorded at 5 minute intervals, up to 100% knockdown. For control bottles lined with only acetone (zero ANVIL® 10+10), % knockdown was observed at 5 minute intervals up to an hour. Each pesticide concentration assay had several trials until a concentration was found that created a timely mortality curve that reached total knockdown around 30 minutes. Once the ANVIL® 10+10 baseline concentration was determined, it could be used against the exposed mosquito populations, with control bottles running simultaneously.

The collection of mosquitoes for the bottle assays were facilitated by the use of several CDC light traps (John W. Hock Co., Gainesville, FL), baited with CO<sub>2</sub> at a flow rate of 500ml/min. ABC standard collection nets (Clarke Mosquito Control Products, Inc., Roselle, IL) were used to contain the mosquitoes, along with a simple food source, until resistance testing took place, which was usually within a couple of hours. The mechanical aspiration from the collection cages to the assay bottles was enabled by the use of a flashlight aspirator (BioQuip Products, Inc., Rancho Dominguez, CA).

The baseline mosquitoes were collected from an area located near an organic farm. This site has been an official exclusion property since 2006, but even prior to that CMMCP

has no record of using adulticide products there. Once the baseline concentration had been determined using these unexposed mosquitoes, collections were made at several other sites that had varying number of adulticide events (~2-15) over the previous couple of years. In 2007 six different locations were used, with two sites having multiple collections and trial sets. An additional site was added in 2008, while bottle assays were concentrated on four different sites in 2009, sites which had been monitored previously. These potentially resistant mosquitoes were then run against the baseline concentration from the unexposed population, as well as control bottles coated with only acetone.

After conducting bottle assays on the collected mosquitoes against the baseline concentration, the knockdown percentage was plotted against the time interval to determine if any degree of resistance was forming in these populations compared to those unexposed. If any specimens survived longer than those of the baseline group, this could represent some degree of resistance has developed.

## RESULTS

The baseline component of the bottle assays that resulted in the optimal concentration of the ANVIL® 10+10 was 22.17µg/ml, which corresponded with data from previous studies (PHEREC 2001). Using this concentration, it was found that in 2007 only one assay of eight trial sets had specimens that did not reach 100% knockdown

before the 25 minute mark. This particular site, Haskell Street, had an average of 98.9% knockdown at the 25 minute mark, and by the next time interval did reach 100% knockdown. Both Otis Street locations had a slower curve than the rest of the

sites, although they still reached 100% knockdown at 25 minutes like the baseline population. As one would expect, the control bottles coated with only acetone had zero knockdown effect (Figures 1, 2).

Figure 1: 2007 Time-% Knockdown Curves of Bottle Assays for ANVIL® 10+10 (22.17µg/ml)



Figure 2: 2007 Time-% Knockdown Curves of Bottle Assays (2) for ANVIL® 10+10 (22.17µg/ml)



The bottle assays performed in 2008 resulted in similar findings to 2007. Of the 13 trial sets, 6 had specimens that did not reach 100% knockdown by the 25

minute mark. However, these findings were not significant and all had knockdown rates at the 25 minute mark of over 97.22%. Again, the acetone only coated bottles had zero knockdown effect (Figure 3).

Figure 3: 2008 Time-% Knockdown Curves of Bottle Assays for ANVIL® 10+10 (22.17µg/ml)



Figure 4: 2008 Time-% Knockdown Curves of Bottle Assays (2) for ANVIL® 10+10 (22.17µg/ml)



Bottle assays performed in 2009 had trials where the specimens did not reach complete knockdown until the 35 minute mark (Figures 5, 6). Of all specimens tested in the 2009 trials, 99.72% of specimens were knocked down at the 30 minute mark or earlier. As with previous seasons, the acetone only coated bottles had zero knockdown effect (Figure 5).

Figure 5: 2009 Time-% Knockdown Curves of Bottle Assays for ANVIL® 10+10 (22.17µg/ml)

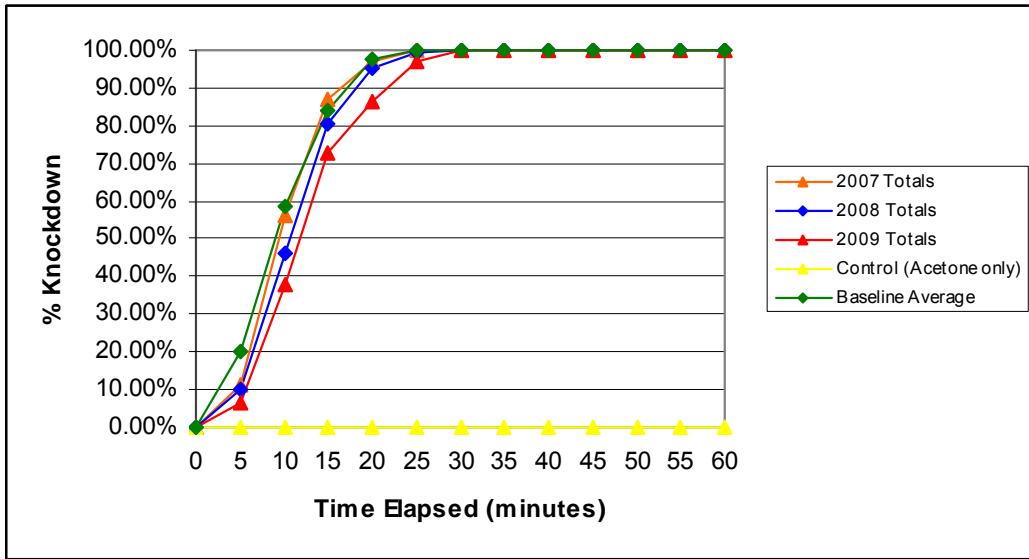


Figure 6: 2009 Time-% Knockdown Curves of Bottle Assays (2) for ANVIL® 10+10 (22.17µg/ml)



Looking at the yearly totals from the three seasons of bottle assays one can observe that the knockdown rate has slowed slightly (Figure 7). The yearly comparisons of bottle assay results show that the 2009 trials have been slower to reach 100% knockdown as opposed to earlier years.

Figure 7: Yearly Comparison of Time-% Knockdown Curves of Bottle Assays for ANVIL® 10+10 (22.17µg/ml)



#### DISCUSSION

The results of the bottle assays indicate that the level of resistance in the populations of the local mosquitoes tested in the CMMCP service area is not significant enough where a change of pesticide or application protocol is needed at this time. This is not necessarily surprising considering the nature of the CMMCP adulticide program, which is primarily request-only in localized, targeted areas. Another reason would be the vast size of the CMMCP service area, encompassing 38 municipalities, with non-member cities and towns with no mosquito control program scattered in and around them. These factors contribute to local mosquito populations not being consistently exposed to a single class of insecticides, lessening the potential development of resistance. The rapid degradation and low residual nature of the insecticide also could

contribute to low resistance development.

CMMCP had used resmethrin (Scourge® Bayer Environmental Science, Montvale, NJ) (EPA Reg. No. 432-667), for their ULV applications since 1988 before switching to ANVIL® 10+10 in 2007. Both products are synthetic pyrethroids. Both insecticides also use piperonyl butoxide (PBO) as a synergist, in different concentrations, with ANVIL® 10+10 using 10% PBO compared to 18% for Scourge® (Center for Disease Control and Prevention 2002; PHEREC 2001). Before using either of those synthetic pyrethroids, CMMCP had been using Malathion, an organophosphate, which is of a different chemical class (Nauen 2006).

Drought conditions in the latter part of 2007 impacted collection numbers, which hindered collections for additional bottle assay trials that

season. The 2008 season collections were not impacted by lack of rain, allowing more trials to be conducted. During 2009, heavy rains dominated the season, and in many instances hampered collection of specimens at previously monitored locations. Additional bottle assays in subsequent seasons will provide more baseline data for resistance management in the CMMCP service area.

Looking at the yearly trends from bottle assays it can be seen that the knockdown rate has become progressively slower, although blood meal stage on the field collected mosquitoes may have influence on this, as well as slight discrepancies between seasonal lab technicians. Despite this, the results of this bottle assays research conducted since 2007 show that the level of resistance in the local mosquito populations tested does not warrant a change in protocol or product, but monitoring for resistance should continue because it is a vital tool in resistance management.

#### ACKNOWLEDGEMENTS

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## HOST-SEEKING ACTIVITY OF MOSQUITOES IN CENTRAL MASSACHUSETTS - 2009

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### ABSTRACT

For a second year, the Central Massachusetts Mosquito Control Project evaluated various time periods for ultra-low volume adulticiding potential by conducting mosquito surveillance using programmable collection devices to observe the host-seeking activity periods for local mosquito species. Collections were made in several habitats for three hour intervals around sunset, with two collections being made before sunset, with another four afterwards. The specimens collected were later identified into several target groups including *Aedes vexans*, *Coquillettidia perturbans*, *Culex pipiens/restuans* complex, *Culiseta melanura*, *Ochlerotatus canadensis*, *Psorophora ferox*, and an *Anopheles* group which included *Anopheles punctipennis* and *Anopheles quadrimaculatus*. Besides *Oc. canadensis* and *Ps. ferox*, all species showed relatively little activity until the period right before sunset. Sunset was then followed by the largest activity period for all targeted mosquito groups except *Oc. canadensis* and *Ps. ferox*. Most species began to taper off for the rest of the collection period, except for *Oc. canadensis*, *Ps. ferox* and the *Anopheles* group which had a slight resurgence in the early morning hours. This season the Norfolk County Mosquito Control Project also collected data for this project. These findings reinforce the adulticiding protocol for CMMCP, which is to commence applications following sunset. Collections may be continued in the upcoming season with or without NCMCP, and will possibly include canopy traps, to further investigate this topic of host-seeking activity.

**NOTE: Full publication pending**

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
02-09-09	Administrative	GPS Coordinates - No Spray
02-17-09	Administrative Contact	Assessor's Office
	Stream Cleaning 20'	Cedar Street Extension
	Stream Cleaning 10'	Cedar Street Extension
	Stream Cleaning 10'	Wedgewood Road
	Stream Cleaning 10'	Wedgewood Road
	Stream Cleaning 30'	Saddle Hill Road
	Stream Cleaning 40'	Saddle Hill Road
	Stream Cleaning 10'	Saddle Hill Road
	Stream Cleaning 10'	Fruit Street
	Stream Cleaning 40'	Fruit Street
	Culvert Cleaning (24)	Cedar Street Ext., Wedgewood Road, Saddle Hill Road, Fruit Street
03-06-09	Stream Cleaning 25'	Lumber Street Ext.,
	Stream Cleaning 10'	Lumber Street
	Stream Cleaning 40'	Granite Street
	Stream Cleaning 30'	Granite Street
	Stream Cleaning 130'	Granite Street
	Stream Cleaning 30'	Briarcliff Lane
	Stream Cleaning 40'	Ash Street
	Stream Cleaning 50'	Front Street
	Stream Cleaning 10'	South Mill Street
	Stream Cleaning 10'	South Mill Street
	Stream Cleaning 20'	Wilson Street
	Stream Cleaning 10'	West Elm Street
	Stream Cleaning 30'	West Elm Street
	Stream Cleaning 20'	West Elm Street
	Stream Cleaning 10'	West Elm Street
	Culvert Cleaning (44)	Lumber Street Ext., Lumber Street, Granite Street, Chestnut Street, Briarcliff Lane, Smith Road, Ash Street, Front Street, Clinton Street, East Street, North Mill Street, Cranberry Lane, South Mill Street
03-26-09	Larviciding	Fruit Street, Huckleberry Road, Bullmoose Run
	Larval Survey	Fruit Street, Huckleberry Road, Cub's Path, Roosevelt Lane, Bullmoose Run, North Street, Saddle Hill Road, Daniel Shays Road, Palomino Drive, Clydesdale Lane, Ridge Road
04-06-09	Public Relations	Daniel Road
	Trap Site Survey	Teresa Road, Colella Farm Road, Chamberlain Street, Sanctuary Lane, Angela Circle, Marie Lane, Nancy Lane, Daniel Road, Joseph Road
04-07-09	Larviciding	Honeysuckle Circle, Emma Drive, Spring Street, Fruit Street, Pond Street
	Larval Survey	Honeysuckle Circle, Rocky Woods Road, Spring Street, Norcross Road, Hill Street, Falcon Ridge Drive, Snowy Owl Road, Spring Street, Fruit Street, Huckleberry Road, Pond Street, Elizabeth Road
04-07-09	Trap Site Survey	Saddle Hill Road, Fruit Street, Huckleberry Road
04-21-09	Administrative Contact	Town Clerk's Office, Board of Health
04-22-09	Public Relations	Honeysuckle Circle, South Mill Street, Lumber Street
	Larviciding	Lumber Street, Granite Street, College Street, South Mill Street
	Larval Survey	Leman Lane, Lumber Street Extension, Lumber Street, Honeysuckle Circle, Greystone Lane, Granite Street, Deer Run, Hayden Rowe
04-29-09	Public Relations	Huckleberry Road, North Street
	Larviciding	Huckleberry Road, North Street
	Larval Survey	Huckleberry Road, Victory Lane, Fruit Street
05-04-09	Public Relations	North Street, School Street, Pond Street, Jaime Lane, Tammer Lane, South Mill Street, Hayden Rowe
	Larviciding	North Street, Pond Street, Hayden Rowe, Clinton Street, East Street, North Mill Street, Front Street, South Mill Street, Blue Berry Lane
	Larval Survey	Fruit Street, School Street, Jaime Lane, Tammer Lane, South Mill Street, East Main Street, Brook Hollow Lane, Hawthorn Lane, Cross Street, Clinton Street, East Street, North Mill Street, Front Street, Cranberry Lane, Blueberry Lane, Briarcliff Drive, Wild Drive, Lumber Street

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
05-12-09	Public Relations Larviciding Larval Survey	Valentine Road, Frankland Road, Huckleberry Road Valentine Road, Huckleberry Road, Erica Drive Frankland Road, Winter Street, West Elm Street, Erica Drive
05-18-09	Larviciding  Larval Survey	Wedgewood Drive, Cedar Street Extension, Cedar Street, Ridge Road Edgehill Road, Wedgewood Drive, Cedar Street Extension, Overlook Drive, Cedar Street, Rafferty Road, Proctor Street, Palomino Drive, Clydesdale Lane, Ridge Road, Saddle Hill Road, Daniel Shays Road, Whalen Street, West Main Street, South Street
05-22-09	Public Relations Larviciding Larval Survey	Brook Hollow Lane, North Street Spring Street Brook Hollow Lane, Ash Street, Chestnut Street, Pond Street, Winter Street, Rocky Woods Road, Emma Drive, Spring Street, Norcross Road, Hill Street
05-29-09	Trap Site Set Up Trap Site Survey	North Street Saddle Hill Road, Joseph Road, Main Street
06-02-09	Administrative Contact Public Relations   Adulticiding	Police Department Clinton Street, Emerson Way, Partridge Road, East Street, North Mill Street, Cold Spring Brook, North Mill Street, Ledge Stone Drive, Tammer Lane, Ash Street, South Mill Street, Valentine Road, Front Street, Stone Crossing, Hearthstone Road, Carriage Hill Road, Main Street, Palomino Drive, Saddle Hill Road, Greenwood Road, Summit Way, Overlook Road, Everett Circle, Lincoln Street, Wedgewood Drive, Cedar Street, Extension Clinton Street, Emerson Way, Partridge Road, East Street, North Mill Street, Cold Spring Brook, North Mill Street, Ledge Stone Drive, Tammer Lane, Ash Street, South Mill Street, Valentine Road, Front Street, Stone Crossing, Hearthstone Road, Carriage Hill Road, Main Street, Palomino Drive, Saddle Hill Road, Greenwood Road, Summit Way, Overlook Road, Everett Circle, Lincoln Street, Wedgewood Drive, Cedar Street Extension, Estates At Highland Ridge
06-04-09	Public Relations Adulticiding Set Up Trap	Old Farm Road Old Farm Road Joseph Road
06-05-09	Administrative Contact Public Relations  Landing Count Adulticiding	Police Department Fruit Street, North Street, Rocky Wood Road, Spring Street, Longwood Drive, Emma Drive, Falcon Ridge Road, Pond Street, West Elm Street, Erika Drive, Tiffany Trail, Meserve Street Spring Street, West Elm Street Fruit Street, North Street, Rocky Wood Road, Spring Street, Longwood Drive, Emma Drive, Falcon Ridge Road, Pond Street, West Elm Street, Erika Drive, Tiffany Trail, Meserve Street, Valleywood Road, Southborough Rod And Gun Club
06-08-09	Pick Up Trap Public Relations Set Up Trap	Joseph Road Wood Street Wood Street, North Street, Saddle Hill Road, Main Street
06-09-09	Administrative Contact Public Relations  Landing Count Adulticiding  Pick Up Trap	Police Department Huckleberry Road, Roosevelt Lane, Rough Ridge Road, Bull Moose Run, Wood Street, Ray Street, Brook Hollow Lane, Holt Street, Blueberry Lane, Thayer Heights, Briar Cliff, Lumber Street, Hillcrest Drive, Dicarolo Road, West Main Street Huckleberry Road, West Main Street Huckleberry Road, Roosevelt Lane, Rough Ridge Road, Bull Moose Run, Wood Street, Ray Street, Brook Hollow Lane, Holt Street, Blueberry Lane, Thayer Heights, Briar Cliff, Lumber Street, Hillcrest Drive, Dicarolo Road, West Main Street North Street, Wood Street, Saddle Hill Road, Main Street

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
06-12-09	Administrative Contact Public Relations	Police Department Wood Street, Stage Coach Way, Winter Street, School Street, John Mathews Road, Peppercorn Road, Old Farm Road, West Elm Street, Valleywood Drive, Tiffany Trail, Whirty Circle, Hayden Rowe, Wild Road, Chestnut Road, Mckay Road, Smith Road, Jackson Road, Oak Street, Kimball Street, Alexander Road, Joseph Road, Chamberlain Street
	Adulticiding	Wood Street, Stage Coach Way, Winter Street, School Street, John Mathews Road, Peppercorn Road, Old Farm Road, West Elm Street, Valleywood Drive, Tiffany Trail, Whirty Circle, Hayden Rowe, Wild Road, Chestnut Road, Mckay Road, Smith Road, Jackson Road, Oak Street, Kimball Street, Alexander Road, Joseph Road, Chamberlain Street
06-15-09	Trap Site Survey	Wood Street, Fruit Street
06-16-09	Administrative Contact Public Relations	Police Department Appaloosa Circle, Saddle Hill Road, Bridgeton Way, Greenwood Road, Overlook Road, Everett Circle, Spring Street, Huckleberry Road, Cub's Path, Roosevelt Lane, Falcon Ridge Road, Westcott Drive, School Street, Winter Street, Barbara Road, West Elm Street, Auciello Drive, Duffield Road, Whirty Circle, Colella Farms Road, Cider Mill Road, Tammer Lane, East Street, North Mill Street, East View Road, Grove Street, Meserve Street, Wood Street
	Adulticiding	Appaloosa Circle, Saddle Hill Road, Bridgeton Way, Greenwood Road, Overlook Road, Everett Circle, Spring Street, Huckleberry Road, Cub's Path, Roosevelt Lane, Falcon Ridge Road, Westcott Drive, School Street, Winter Street, Barbara Road, West Elm Street, Auciello Drive, Duffield Road, Whirty Circle, Colella Farms Road, Cider Mill Road, Tammer Lane, East Street, North Mill Street, East View Road, Grove Street, Meserve Street, Wood Street
06-17-09	Trap Site Survey	Wood Street
06-18-09	Set Up Trap	Joseph Road
06-19-09	Pick Up Trap	Joseph Road
06-22-09	Set Up Trap	Wood Street, North Street, Saddle Hill Road, Main Street
06-23-09	Pick Up Trap Administrative Contact Public Relations	Wood Street, North Street, Saddle Hill Road, Main Street Police Department Wedgewood Drive, Greenwood Road, Overlook Road, Rough Rider Road, Morse Lane, Longwood Road, Spring Street, Falcon Ridge Road, Westcott Drive, Hillcrest Drive, Ledge Stone Road, Jordan Road, Valentine Road, Thayer Heights Road, Ash Street, Carriage Hill Road, Hearth Stone Road, Cross Street, Main Street, Meserve Street, Ash Street
	Landing Count	Spring Street, Wedgewood Drive
	Adulticiding	Wedgewood Drive, Greenwood Road, Overlook Road, Rough Rider Road, Morse Lane, Longwood Road, Spring Street, Falcon Ridge Road, Westcott Drive, Hillcrest Drive, Ledge Stone Road, Jordan Road, Valentine Road, Thayer Heights Road, Ash Street, Carriage Hill Road, Hearth Stone Road, Cross Street, Main Street, Meserve Street, Ash Street
	Catch Basin Larviciding [100]	Daniel Shay Road, Equestrian Drive, Palomino Drive, Clydesdale Lane, Ridge Road, Appaloosa Circle
06-24-09	Trap Site Survey	Saddle Hill Road
06-30-09	Administrative Contact Public Relations	Police Department, Board of Health Wood Street, Meserve Street, Main Street, Stowe Crossing Hearthstone Road, Wilson Street, Cross Street, North Mill Street, East Street, North Mill Street, Tammer Lane, Cider Mill Road, Chestnut Street, Chamberlain Street, College Street, Blackthorne Circle, Whirty Circle, West Main Street, Elizabeth Road, Winter Street, Pond Street, Spring Street, Falcon Ridge Road
	Landing Count	Wood Street, North Mill Street
06-30-09	Adulticiding	Wood Street, Meserve Street, Main Street, Stowe Crossing Hearthstone Road, Wilson Street, Cross Street, North Mill Street, East Street, North Mill Street, Tammer Lane, Cider Mill Road, Chestnut Street, Chamberlain Street, College Street, Blackthorne Circle, Whirty Circle, West

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
06-30-09	Adulticiding (cont)	Main Street, Elizabeth Road, Winter Street, Pond Street, Spring Street, Falcon Ridge Road
	Catch Basin Larviciding [400]	Stagecoach Way, Winter Street, Sylvan Way, Highland Street, Erin's Way, Mechanic Street, Piazza Lane, Dale Road, Whitehall Lane, White Street, Cunningham Street, Victory Lane, North Street, Washington Lane, Rough Rider Ridge, Colonnade Drive, Cubs Path, Huckleberry Road, Wood Street, Rice Street, Morse Lane, Spring Lane, Longwood Drive, Ralf Road, Emma Drive, Castle Hill Road, Norcross Road, Hill Street, Lyford Road, Spring Street, Falcon Ridge Road
07-01-09	Catch Basin Larviciding [200]	Stonegate Road, Elizabeth Road, Gina Drive, John Matthew Road, Andrea Drive, Christian Way, Pond Street, Wescott Drive, Pegs Way, Jamie Lane, Donna Pass, Stewart Street, Heidi Circle
07-02-09	Set Up Trap	Joseph Road
07-06-09	Set Up Trap	Wood Street, North Street, Saddle Hill Road, Main Street
	Pick Up Trap	Joseph Road
07-07-09	Pick Up Trap	Wood Street, North Street, Saddle Hill Road, Main Street
	Administrative Contact	Police Department
	Public Relations	Victory Lane, Fruit Street, North Street, Roosevelt Lane, Rough Rider Road, Bullmoose Run, Huckleberry Road, Wood Street, Proctor Street, Hayden Rowe, Chestnut Street, Hopkins Road, Valentine Road, Thayer Heights Road, Lincoln Street, Wedgewood Road, Greenwood Road
	Adulticiding	Victory Lane, Fruit Street, North Street, Roosevelt Lane, Rough Rider Road, Bullmoose Run, Huckleberry Road, Wood Street, Proctor Street, Hayden Rowe, Chestnut Street, Hopkins Road, Valentine Road, Thayer Heights Road, Lincoln Street, Wedgewood Road, Greenwood Road, Highland Ridge Estates
	Catch Basin Larviciding [390]	Overlook Road, Trevor Lane, Summit Way, Everett Circle, Greenwood Road, Proctor Street, Walker Street, Oliver Lane, Elm Street, Parkwood Drive, Atwood Drive, Hayward Street, Downey Street, Oakhurst Road, Scarlata Road, Pinecrest Village, School Street, D.J. Murphy Lane, Barbara Road, Dicarolo Road, Canterbury Lane, Old Farm Road, Ark Road, Priscilla Road, Country Way, Princess Lane, Pond Street, Lyn Path, Tiffany Trail, Valleywood Road, Erika Drive
07-14-09	Administrative Contact	Police Department
	Public Relations	Fruit Street, Spring Street, Morse Lane, Falcon Ridge Road, Stewart Street, Pond Street, Tiffany Trail, West Elm Street, John Mathews Road, West Main Street, Hillcrest Road, Hayward Street, Knoll Road, Duffield Road, Pine Island Road, Whirty Circle, Break Neck Hill Lumber Street, College Street, Ash Street, South Mill Street, Alprilla Farm Road, North Mill Street
	Adulticiding	Fruit Street, Spring Street, Morse Lane, Falcon Ridge Road, Stewart Street, Pond Street, Tiffany Trail, West Elm Street, John Mathews Road, West Main Street, Hillcrest Road, Hayward Street, Duffield Road, Pine Island Road, Whirty Circle, Breakneck Hill Road, Lumber Street, College Street, Ash Street, South Mill Street, Alprilla Farm Road, North Main Street, Pendulum Pass Island Road, Ash Street, Spring Street, Fruit Street
	Landing Count	
07-16-09	Set Up Trap	Joseph Road
07-17-09	Pick Up Trap	Joseph Road
07-20-09	Set Up Trap	Wood Street, North Street, Saddle Hill Road, Main Street
07-21-09	Pick Up Trap	Wood Street, North Street, Saddle Hill Road, Main Street
	Administrative Contact	Police Department, Board of Health
07-21-09	Public Relations	Appaloosa Circle, Saddle Hill Road, Greenwood Road, Wedgewood Drive, Huckleberry Road, Rough Rider Road, Roosevelt Lane, Bull Moose Run, North Street, Wood Street, Chamberlain Road, Kimball Street, Oak Street, Connelly Hill Road, Ash Street, Carriage Hill Road, Stone Crossing Way, Hearth Stone Road, Eastview Road
	Larval Survey	Chamberlain Street

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
07-22-09	Catch Basin Larviciding [171]	Saddle Hill Road, Edgehill Road, Bridgeton Way, Wedgewood Drive, Singletary Way, River Bend Road, Patriots Boulevard, Paul Revere Path
07-23-09	Administrative Contact Public Relations Landing Count	Police Department Bullmoose Avenue, East Main Street East Main Street, Bullmoose Run
07-28-09	Administrative Contact Public Relations  Landing Count Adulticiding	Police Department Appaloosa Circle, Saddle Hill Road, Greenwood Road, Wedgewood Drive, Huckleberry Road, Roosevelt Lane, Rough Rider Road, Bullmoose Run, North Street, Victory Lane, Wood Street, Winter Street, Chamberlain Street, Hayden Rowe Street, College Street, Kimball Road, Oak Street, Connelly Hill Road, Thayer Heights Road, Ash Street, Stone Crossing Way, Carriage Hill Road, Hearthstone Road, Eastview Road, Main Street, Meserve Street, Marshall Street Wood Street, College Street Appaloosa Circle, Saddle Hill Road, Greenwood Road, Wedgewood Drive, Huckleberry Road, Roosevelt Lane, Rough Rider Road, Bullmoose Run, North Street, Victory Lane, Wood Street, Winter Street, Chamberlain Street, Hayden Rowe Street, College Street, Kimball Road, Oak Street, Connelly Hill Road, Thayer Heights Road, Ash Street, Stone Crossing Way, Carriage Hill Road, Hearthstone Road, Eastview Road, Main Street, Meserve Street, Marshall Street, Bull Moose Run
07-30-09	Set Up Trap	Joseph Road
07-31-09	Pick Up Trap	Joseph Road
08-03-09	Set Up Trap	Wood Street, North Street, Main Street, Saddle Hill Road
08-04-09	Pick Up Trap Administrative Contact Public Relations  Adulticiding	Wood Street, North Street, Main Street, Saddle Hill Road Police Department Spring Street, Morse Lane, Longwood Drive, Emma Drive, Ralph Road, Spring Street, Pegs Way, Pond Street, West Elm Street, Old Farm Road, Peppercorn Road, Barbara Road, Dicarolo Road, Elizabeth Road, Glen Road, Whirty Circle, Chestnut Street, South Mill Street, Tammer Lane, North Mill Street, Valentine Street, Ledge Stone Road, Stone Crossing Way Spring Street, Morse Lane, Longwood Drive, Emma Drive, Ralph Road, Spring Street, Pegs Way, Pond Street, West Elm Street, Old Farm Road, Peppercorn Road, Barbara Road, Dicarolo Road, Elizabeth Road, Glen Road, Whirty Circle, Chestnut Street, South Mill Street, Tammer Lane, North Mill Street, Valentine Street, Ledge Stone Road, Stone Crossing Way
08-06-09	Administrative Contact Public Relations Adulticiding	Police Department Pond Street Pond Street
08-11-09	Administrative Contact Public Relations  Adulticiding	Police Department, Board of Health Proctor Street, Wood Street, Fruit Street, North Street, Huckleberry Road, Roosevelt Lane, Bullmoose Run, Spring Street, Longwood Drive, Snowy Owl Road, Falcon Ridge Road, Pond Street, Stage Coach Way, Meserve Street, Huckleberry Road, West Elm Street, Lyn Path, Circle Drive, Elizabeth Road, West Main Street, Duffield Road, Hillcrest Drive, Chamberlain Street, College Street, Joseph Road, Benson Road, Oak Street, Kimball Road, Jackson Street, Connelly Hill Road, Bowker Road, Smith Road, South Mill Street, Cider Mill Road Proctor Street, Wood Street, Fruit Street, North Street, Huckleberry Road, Roosevelt Lane, Bullmoose Run, Spring Street, Longwood Drive, Snowy Owl Road, Falcon Ridge Road, Pond Street, Stage Coach Way, Meserve Street,
08-11-09	Adulticiding	West Elm Street, Lyn Path, Circle Drive, Elizabeth Road, West Main Street, Duffield Road, Hillcrest Drive, Chamberlain Street, College Street, Joseph Road, Benson Road, Oak Street, Kimball Road, Jackson Street, Connelly Hill Road, Bowker Road, Smith Road, South Mill Street, Cider Mill Road

TOWN OF HOPKINTON

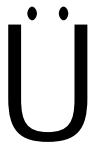
<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
08-12-09	Administrative Contact Public Relations Adulticiding	Police Department Benson Road Benson Road
08-13-09	Set Up Trap	Joseph Road
08-14-09	Pick Up Trap	Joseph Road
08-17-09	Set Up Trap	Wood Street, North Street, Main Street, Saddle Hill Road
08-18-09	Pick Up Trap Administrative Contact Public Relations  Larval Survey Adulticiding	Wood Street, North Street, Main Street, Saddle Hill Road Police Department Fruit Street, White Street, Victory Lane, Huckleberry Road, Rough Rider Road, Bullmoose Run, Greenwood Road, Everett Circle, North Street, Wood Street, Spring Street, Morse Lane, Peg's Way, Pond Street, Lumber Street, Whirly Circle, Michael's Way, South Mill Street, Valentine Road, Clinton Street, Hopkins Road, Front Street, North Mill Street, East Street, Wood Street White Street Fruit Street, White Street, Victory Lane, Huckleberry Road, Rough Rider Road, Bullmoose Run, Greenwood Road, Everett Circle, North Street, Wood Street, Spring Street, Morse Lane, Peg's Way, Pond Street, Lumber Street, Whirly Circle, Michael's Way, South Mill Street, Valentine Road, Clinton Street, Hopkins Road, Front Street, North Mill Street, East Street
08-19-09	Administrative Contact Public Relations Adulticiding	Police Department Wood Street Wood Street
08-24-09	Public Relations Adulticiding	Pine Island Road Pine Island Road
08-25-09	Administrative Contact Public Relations  Adulticiding	Police Department, Board of Health Roosevelt Lane, Bullmoose Run, North Street, Wood Street, Proctor Street, Spring Street, Falcon Ridge Road, Pond Street, Winter Street, School Street, West Main Street, Teresa Road, Alexander Road, Chamberlain Street, Thayer Heights Road, Stone Crossing Road, Hearthstone Road, Meserve Street, Hopkins Street Roosevelt Lane, Bullmoose Run, North Street, Wood Street, Proctor Street, Spring Street, Falcon Ridge Road, Pond Street, Winter Street, School Street, West Main Street, Teresa Road, Alexander Road, Chamberlain Street, Thayer Heights Road, Stone Crossing Road, Hearthstone Road, Meserve Street
08-27-09	Set Up Trap Pick Up Trap	Saddle Hill Road, Joseph Road Saddle Hill Road
08-28-09	Pick Up Trap	Joseph Road
08-31-09	Set Up Trap	Saddle Hill Road, Main Street
09-01-09	Pick Up Trap Administrative Contact Public Relations  Adulticiding	Saddle Hill Road, Main Street Police Department Greenwood Road, Saddle Hill Road, Huckleberry Road, North Street, White Street, Fruit Street, Spring Street, Pond Street, Valleywood Road, West Elm Street, Winter Street, Priscilla Road, Dicarolo Road, John Matthews Road, West Main Street, Hillcrest Drive, McBride Drive, College Street, Tammer Circle, North Mill Street, Ash Street, Meserve Street, Wood Street, Whaler Street, Coburn Road Greenwood Road, Saddle Hill Road, Huckleberry Road, North Street, White Street, Fruit Street, Spring Street, Pond Street, Valleywood Road, West Elm Street, Winter Street, Priscilla Road, Dicarolo Road, John Matthews Road, West Main Street, Hillcrest Drive, McBride Drive, College Street, Tammer Circle, North Mill Street, Ash Street, Meserve Street, Wood Street, Whaler Street, Coburn Road
09-02-09	Pick Up Trap Set Up Trap	Saddle Hill Road, North Street, Wood Street, Main Street Saddle Hill Road
09-03-09	Adulticiding	Woodville Rod & Gun Club
09-10-09	Set Up Trap	Joseph Road
09-11-09	Pick Up Trap	Joseph Road
09-14-09	Set Up Trap	Main Street, Saddle Hill Road
09-15-09	Public Relations Set Up Trap	Wood Street Wood Street, North Street

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
09-15-09	Pick Up Trap	Saddle Hill Road, Main Street
09-17-09	Pick Up Trap	Wood Street, North Street
09-24-09	Set Up Trap	Joseph Road
09-25-09	Pick Up Trap	Joseph Road
09-28-09	Set Up Trap	Saddle Hill Road, Main Street
09-29-09	Pick Up Trap	Saddle Hill Road, Main Street
	Set Up Trap	Wood Street, North Street
09-30-09	Stream Survey	North Mill Street
10-08-09	Set Up Trap	Joseph Road
10-09-09	Pick Up Trap	Joseph Road
10-13-09	Stream Cleaning 10'	Huckleberry Road
	Stream Cleaning 20'	Fruit Street
	Stream Cleaning 40'	Fruit Street
	Stream Cleaning 10'	Fruit Street
	Stream Cleaning 10'	Stoney Brook Road
	Stream Cleaning 10'	Wedgewood Road
	Stream Cleaning 10'	Wedgewood Road
	Stream Cleaning 40'	Cedar Street Extension
	Stream Cleaning 10'	Overlook Road
	Stream Cleaning 10'	Overlook Road
	Stream Cleaning 10'	Overlook Road
	Stream Cleaning 10'	Overlook Road
	Stream Cleaning 10'	Overlook Road
	Stream Cleaning 10'	Saddle Hill Road
	Stream Cleaning 30'	Saddle Hill Road
	Stream Cleaning 10'	Saddle Hill Road
	Stream Cleaning 40'	Fruit Street
	Culvert Cleaning (33)	Huckleberry Road, Fruit Street, Bridgeton Way, Edgehill Road, Stoney Brook Road, Wedgewood Road, Cedar Street Extension, Overlook Road, Greenwood Road, Saddle Hill Road
10-20-09	Pick Up Trap	Saddle Hill Road
10-26-09	Pick Up Trap Sites	North Street, Wood Street
10-27-09	Pick Up Trap Site	Saddle Hill Road
11-02-09	Stream Cleaning 60'	Lumber Street
	Stream Cleaning 20'	Lumber Street
	Stream Cleaning 20'	Lumber Street
	Stream Cleaning 30'	Lumber Street
	Stream Cleaning 100'	Granite Street
	Stream Cleaning 40'	Granite Street
	Stream Cleaning 30'	Granite Street
	Stream Cleaning 20'	College Street
	Stream Cleaning 40'	Chestnut Street
	Stream Cleaning 30'	Chestnut Street
	Culvert Cleaning (3)	Lumber Street, Granite Street, Chestnut Street
12-11-09	Stream Cleaning 70'	Winter Street
	Stream Cleaning 80'	Winter Street
	Stream Cleaning 120'	Winter Street
	Stream Cleaning 30'	Winter Street
	Stream Cleaning 40'	Pond Street
	Stream Cleaning 10'	Pond Street
	Stream Cleaning 10'	Pond Street
	Stream Cleaning 100'	Pond Street
	Stream Cleaning 10'	Pond Street
	Stream Cleaning 75'	Pond Street
	Stream Cleaning 80'	Pond Street
	Stream Cleaning 20'	Winter Street
	Stream Cleaning 10'	Winter Street
	Stream Cleaning 10'	Pond Street
	Stream Cleaning 10'	Pond Street
	Stream Cleaning 30'	Pond Street
	Stream Cleaning 30'	Spring Street
	Stream Cleaning 40'	Spring Street
	Stream Cleaning 20'	Spring Street
12-11-09	Culvert Cleaning (18)	Winter Street, Pond Street, Spring Street
12-15-09	Stream Cleaning 100'	North Street
	Stream Cleaning 120'	Washington Street
	Stream Cleaning 10'	Baldwin Lane
	Stream Cleaning 40'	North Street

TOWN OF HOPKINTON

<u>DATE</u>	<u>WORK DONE</u>	<u>LOCATION</u>
12-15-09	Stream Cleaning 40'	Rocky Woods Road
	Stream Cleaning 40'	Rocky Woods Road
	Culvert Cleaning (6)	North Street, Washington Street, Baldwin Lane, North Street, Rocky Woods Road
12-22-09	Stream Cleaning 50'	West Elm Street
	Culvert Cleaning (1)	West Elm Street



# Town of Hopkinton: Catch Basin Larvicide Program 2009

— Catch Basins Surveyed/Treated

WESTBOROUGH

SOUTHBOROUGH

ASHLAND

WNV+  
9/12/2008

HOLLISTON

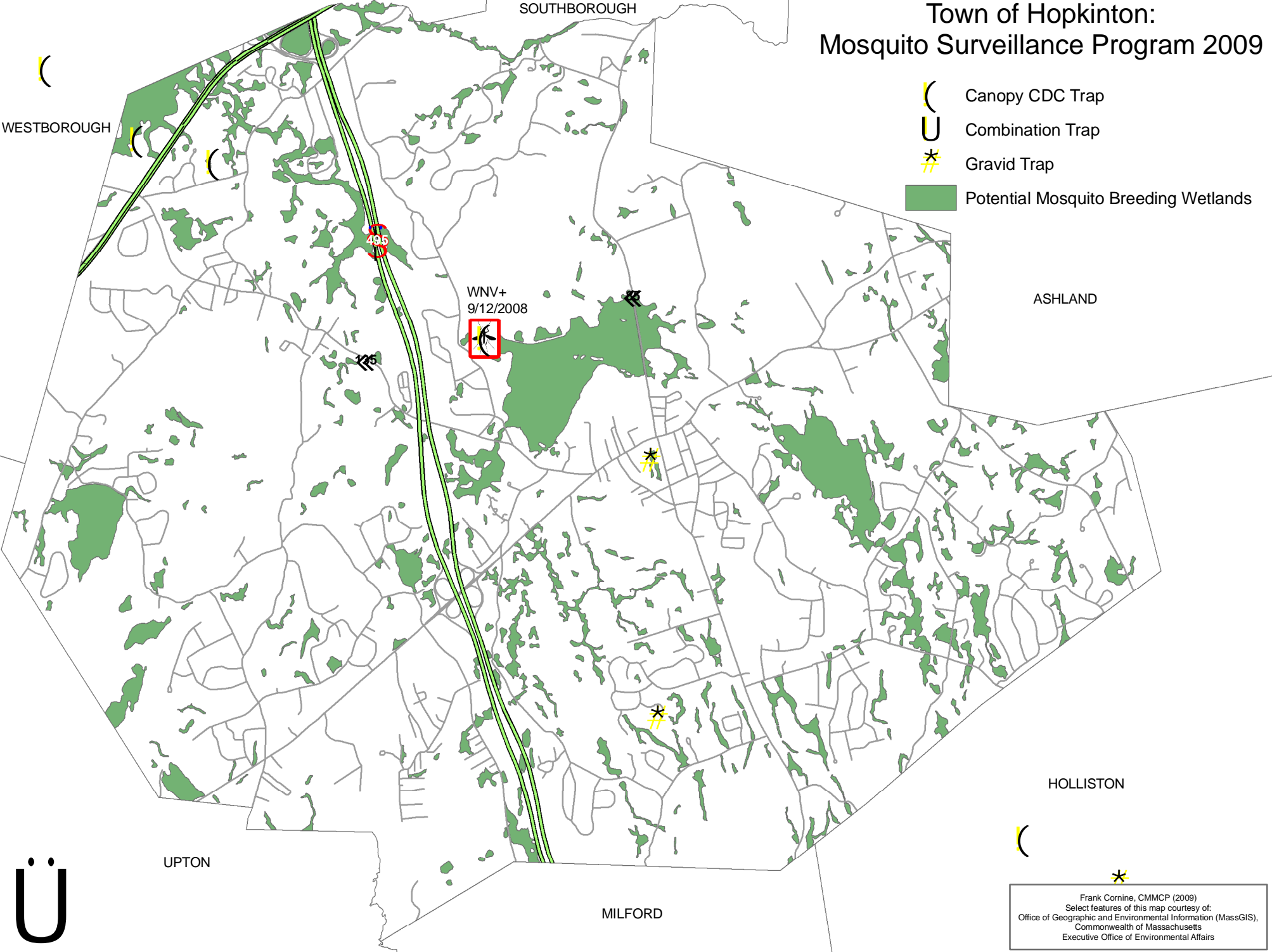
UPTON

MILFORD

(Catch Basins Treated: 1,261)

Frank Cornine, CMMCP (2009)  
Select features of this map courtesy of:  
Office of Geographic and Environmental Information (MassGIS),  
Commonwealth of Massachusetts  
Executive Office of Environmental Affairs

# Town of Hopkinton: Mosquito Surveillance Program 2009



- ( Canopy CDC Trap
- U Combination Trap
- \* Gravid Trap
- █ Potential Mosquito Breeding Wetlands

WNV+  
9/12/2008

Frank Cornine, CMMCP (2009)  
 Select features of this map courtesy of:  
 Office of Geographic and Environmental Information (MassGIS),  
 Commonwealth of Massachusetts  
 Executive Office of Environmental Affairs

HOPKINTON SURVEILLANCE DATA  
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
1	Hopkinton	CM09NS-0112	6/4/2009	1	Joseph Rd.	6	<i>Culex species</i>	N/S	
2	Hopkinton	CM09NS-0144	6/8/2009	1	Saddle Hill Rd.	3	<i>Culiseta melanura</i>	N/S	
3	Hopkinton	CM09NS-0145	6/8/2009	1	Saddle Hill Rd.	2	<i>Coquillettidia perturbans</i>	N/S	
4	Hopkinton	CM09NS-0146	6/8/2009	1	Saddle Hill Rd.	2	<i>Ochlerotatus provocans</i>	N/S	
5	Hopkinton	CM09NS-0147	6/8/2009	1	Saddle Hill Rd.	2	<i>Anopheles punctipennis</i>	N/S	
6	Hopkinton	CM09NS-0148	6/8/2009	1	Saddle Hill Rd.	25	<i>Ochlerotatus canadensis</i>	N/S	
7	Hopkinton	CM09NS-0179	6/8/2009	1	Main St.	6	<i>Culex species</i>	N/S	
8	Hopkinton	CM09NS-0241	6/8/2009	1	Wood St.	6	<i>Ochlerotatus canadensis</i>	N/S	
9	Hopkinton	CM09NS-0242	6/8/2009	1	North St.	4	<i>Culiseta melanura</i>	N/S	
10	Hopkinton	CM09NS-0243	6/8/2009	1	North St.	1	<i>Ochlerotatus canadensis</i>	N/S	
11	Hopkinton	CM09NS-0244	6/8/2009	1	North St.	1	<i>Aedes vexans</i>	N/S	
12	Hopkinton	CM09NS-0245	6/8/2009	1	North St.	6	<i>Coquillettidia perturbans</i>	N/S	
13	Hopkinton	CM09NS-0246	6/8/2009	1	North St.	1	<i>Ochlerotatus abseratus</i>	N/S	
14	Hopkinton	CM09NS-0374	6/18/2009	1	Joseph Rd.	2	<i>Ochlerotatus japonicus</i>	N/S	
15	Hopkinton	CM09-0022	6/22/2009	1	Saddle Hill Rd.	46	<i>Culiseta melanura</i>	WNV & EEE	Negative
16	Hopkinton	CM09NS-0380	6/22/2009	1	North St.	3	<i>Culex species</i>	N/S	
17	Hopkinton	CM09NS-0381	6/22/2009	1	North St.	2	<i>Culiseta melanura</i>	N/S	
18	Hopkinton	CM09NS-0382	6/22/2009	1	North St.	1	<i>Culiseta morsitans</i>	N/S	
19	Hopkinton	CM09NS-0383	6/22/2009	1	North St.	9	<i>Coquillettidia perturbans</i>	N/S	
20	Hopkinton	CM09NS-0384	6/22/2009	1	Wood St.	4	<i>Culex species</i>	N/S	
21	Hopkinton	CM09NS-0385	6/22/2009	1	Wood St.	6	<i>Culiseta melanura</i>	N/S	
22	Hopkinton	CM09NS-0386	6/22/2009	1	Wood St.	14	<i>Ochlerotatus canadensis</i>	N/S	
23	Hopkinton	CM09NS-0387	6/22/2009	1	Wood St.	1	<i>Ochlerotatus excrucians</i>	N/S	
24	Hopkinton	CM09NS-0388	6/22/2009	1	Wood St.	34	<i>Coquillettidia perturbans</i>	N/S	
25	Hopkinton	CM09NS-0424	6/22/2009	1	Saddle Hill Rd.	8	<i>Culiseta morsitans</i>	N/S	
26	Hopkinton	CM09NS-0425	6/22/2009	1	Saddle Hill Rd.	4	<i>Culex species</i>	N/S	
27	Hopkinton	CM09NS-0426	6/22/2009	1	Saddle Hill Rd.	4	<i>Ochlerotatus canadensis</i>	N/S	
28	Hopkinton	CM09NS-0427	6/22/2009	1	Saddle Hill Rd.	2	<i>Ochlerotatus excrucians</i>	N/S	
29	Hopkinton	CM09NS-0428	6/22/2009	1	Saddle Hill Rd.	3	<i>Coquillettidia perturbans</i>	N/S	
30	Hopkinton	CM09NS-0440	6/22/2009	1	Main St.	4	<i>Culex species</i>	N/S	
31	Hopkinton	CM09NS-0441	6/22/2009	1	Main St.	3	<i>Ochlerotatus japonicus</i>	N/S	
32	Hopkinton	CM09-0069	7/6/2009	1	Main St.	22	<i>Culex species</i>	WNV & EEE	Negative
33	Hopkinton	CM09NS-0625	7/6/2009	1	Wood St.	5	<i>Culex species</i>	N/S	
34	Hopkinton	CM09NS-0626	7/6/2009	1	Wood St.	2	<i>Culiseta melanura</i>	N/S	
35	Hopkinton	CM09NS-0627	7/6/2009	1	Wood St.	51	<i>Coquillettidia perturbans</i>	N/S	
36	Hopkinton	CM09NS-0628	7/6/2009	1	Wood St.	1	<i>Psorophora ferox</i>	N/S	

HOPKINTON SURVEILLANCE DATA  
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
37	Hopkinton	CM09NS-0629	7/6/2009	1	Wood St.	1	<i>Ochlerotatus triseriatus</i>	N/S	
38	Hopkinton	CM09NS-0630	7/6/2009	1	Wood St.	7	<i>Ochlerotatus canadensis</i>	N/S	
39	Hopkinton	CM09NS-0631	7/6/2009	1	North St.	8	<i>Culex species</i>	N/S	
40	Hopkinton	CM09NS-0632	7/6/2009	1	North St.	1	<i>Ochlerotatus canadensis</i>	N/S	
41	Hopkinton	CM09NS-0633	7/6/2009	1	North St.	59	<i>Coquillettidia perturbans</i>	N/S	
42	Hopkinton	CM09NS-0660	7/6/2009	1	Saddle Hill Rd.	4	<i>Culex species</i>	N/S	
43	Hopkinton	CM09NS-0661	7/6/2009	1	Saddle Hill Rd.	3	<i>Culiseta melanura</i>	N/S	
44	Hopkinton	CM09NS-0662	7/6/2009	1	Saddle Hill Rd.	2	<i>Culiseta morsitans</i>	N/S	
45	Hopkinton	CM09NS-0663	7/6/2009	1	Saddle Hill Rd.	6	<i>Anopheles punctipennis</i>	N/S	
46	Hopkinton	CM09NS-0664	7/6/2009	1	Saddle Hill Rd.	1	<i>Aedes vexans</i>	N/S	
47	Hopkinton	CM09NS-0665	7/6/2009	1	Saddle Hill Rd.	13	<i>Ochlerotatus canadensis</i>	N/S	
48	Hopkinton	CM09NS-0666	7/6/2009	1	Saddle Hill Rd.	4	<i>Ochlerotatus excrucians</i>	N/S	
49	Hopkinton	CM09NS-0667	7/6/2009	1	Saddle Hill Rd.	165	<i>Coquillettidia perturbans</i>	N/S	
50	Hopkinton	CM09NS-0668	7/6/2009	1	Saddle Hill Rd.	1	<i>Psorophora ferox</i>	N/S	
51	Hopkinton	CM09NS-0685	7/6/2009	1	Main St.	6	<i>Ochlerotatus japonicus</i>	N/S	
52	Hopkinton	CM09-0126	7/16/2009	1	Joseph Rd.	47	<i>Culex species</i>	WNV & EEE	Negative
53	Hopkinton	CM09NS-0923	7/16/2009	1	Joseph Rd.	29	<i>Ochlerotatus japonicus</i>	N/S	
54	Hopkinton	CM09NS-0924	7/16/2009	1	Joseph Rd.	1	<i>Ochlerotatus triseriatus</i>	N/S	
55	Hopkinton	CM09NS-0925	7/16/2009	1	Joseph Rd.	1	<i>Ochlerotatus canadensis</i>	N/S	
56	Hopkinton	CM09-0132	7/20/2009	1	North St.	41	<i>Culex species</i>	WNV & EEE	Negative
57	Hopkinton	CM09-0137	7/20/2009	1	Wood St.	34	<i>Culex species</i>	WNV & EEE	Negative
58	Hopkinton	CM09-0139	7/20/2009	1	Main St.	32	<i>Culex species</i>	WNV & EEE	Negative
59	Hopkinton	CM09NS-0932	7/20/2009	1	North St.	1	<i>Culiseta melanura</i>	N/S	
60	Hopkinton	CM09NS-0933	7/20/2009	1	North St.	83	<i>Coquillettidia perturbans</i>	N/S	
61	Hopkinton	CM09NS-0934	7/20/2009	1	North St.	7	<i>Ochlerotatus trivittatus</i>	N/S	
62	Hopkinton	CM09NS-0935	7/20/2009	1	North St.	2	<i>Ochlerotatus triseriatus</i>	N/S	
63	Hopkinton	CM09NS-0941	7/20/2009	1	Wood St.	4	<i>Culiseta melanura</i>	N/S	
64	Hopkinton	CM09NS-0942	7/20/2009	1	Wood St.	4	<i>Ochlerotatus canadensis</i>	N/S	
65	Hopkinton	CM09NS-0943	7/20/2009	1	Wood St.	2	<i>Psorophora ferox</i>	N/S	
66	Hopkinton	CM09NS-0944	7/20/2009	1	Wood St.	1	<i>Ochlerotatus triseriatus</i>	N/S	
67	Hopkinton	CM09NS-0945	7/20/2009	1	Wood St.	105	<i>Coquillettidia perturbans</i>	N/S	
68	Hopkinton	CM09NS-0946	7/20/2009	1	Wood St.	1	<i>Anopheles punctipennis</i>	N/S	
69	Hopkinton	CM09NS-0947	7/20/2009	1	Wood St.	1	<i>Anopheles quadrimaculatus</i>	N/S	
70	Hopkinton	CM09NS-0948	7/20/2009	1	Wood St.	2	<i>Ochlerotatus trivittatus</i>	N/S	
71	Hopkinton	CM09NS-0951	7/20/2009	1	Main St.	12	<i>Ochlerotatus japonicus</i>	N/S	
72	Hopkinton	CM09NS-0952	7/20/2009	1	Main St.	1	<i>Ochlerotatus triseriatus</i>	N/S	

HOPKINTON SURVEILLANCE DATA  
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
73	Hopkinton	CM09NS-1066	7/20/2009	1	Saddle Hill Rd.	3	<i>Culex species</i>	N/S	
74	Hopkinton	CM09NS-1067	7/20/2009	1	Saddle Hill Rd.	2	<i>Culiseta melanura</i>	N/S	
75	Hopkinton	CM09NS-1068	7/20/2009	1	Saddle Hill Rd.	1	<i>Culiseta morsitans</i>	N/S	
76	Hopkinton	CM09NS-1069	7/20/2009	1	Saddle Hill Rd.	4	<i>Ochlerotatus canadensis</i>	N/S	
77	Hopkinton	CM09NS-1070	7/20/2009	1	Saddle Hill Rd.	1	<i>Ochlerotatus triseriatus</i>	N/S	
78	Hopkinton	CM09NS-1071	7/20/2009	1	Saddle Hill Rd.	1	<i>Aedes cinereus</i>	N/S	
79	Hopkinton	CM09NS-1072	7/20/2009	1	Saddle Hill Rd.	3	<i>Ochlerotatus excrucians</i>	N/S	
80	Hopkinton	CM09NS-1073	7/20/2009	1	Saddle Hill Rd.	14	<i>Anopheles punctipennis</i>	N/S	
81	Hopkinton	CM09NS-1074	7/20/2009	1	Saddle Hill Rd.	116	<i>Coquillettidia perturbans</i>	N/S	
82	Hopkinton	CM09NS-1075	7/20/2009	1	Saddle Hill Rd.	24	<i>Aedes vexans</i>	N/S	
83	Hopkinton	CM09NS-1076	7/20/2009	1	Saddle Hill Rd.	3	<i>Psorophora ferox</i>	N/S	
84	Hopkinton	CM09NS-1077	7/20/2009	1	Saddle Hill Rd.	2	<i>Ochlerotatus trivittatus</i>	N/S	
85	Hopkinton	CM09-0208	7/30/2009	2	Joseph Rd.	50	<i>Ochlerotatus japonicus</i>	WNV & EEE	Negative
86	Hopkinton	CM09NS-1320	7/30/2009	2	Joseph Rd.	18	<i>Ochlerotatus triseriatus</i>	N/S	
87	Hopkinton	CM09NS-1321	7/30/2009	2	Joseph Rd.	6	<i>Culex species</i>	N/S	
88	Hopkinton	CM09-0224	8/3/2009	2	Main St.	50	<i>Culex species</i>	WNV & EEE	Negative
89	Hopkinton	CM09-0238	8/3/2009	1	North St.	50	<i>Culex species</i>	WNV & EEE	Negative
90	Hopkinton	CM09NS-1378	8/3/2009	2	Main St.	6	<i>Culex species</i>	N/S	
91	Hopkinton	CM09NS-1379	8/3/2009	2	Main St.	11	<i>Ochlerotatus japonicus</i>	N/S	
92	Hopkinton	CM09NS-1380	8/3/2009	2	Main St.	8	<i>Ochlerotatus triseriatus</i>	N/S	
93	Hopkinton	CM09NS-1381	8/3/2009	2	Main St.	2	<i>Anopheles punctipennis</i>	N/S	
94	Hopkinton	CM09NS-1403	8/3/2009	1	Saddle Hill Rd.	3	<i>Culex species</i>	N/S	
95	Hopkinton	CM09NS-1404	8/3/2009	1	Saddle Hill Rd.	12	<i>Coquillettidia perturbans</i>	N/S	
96	Hopkinton	CM09NS-1405	8/3/2009	1	Saddle Hill Rd.	2	<i>Anopheles punctipennis</i>	N/S	
97	Hopkinton	CM09NS-1471	8/3/2009	1	North St.	5	<i>Culex species</i>	N/S	
98	Hopkinton	CM09NS-1472	8/3/2009	1	North St.	2	<i>Culiseta melanura</i>	N/S	
99	Hopkinton	CM09NS-1473	8/3/2009	1	North St.	1	<i>Aedes vexans</i>	N/S	
100	Hopkinton	CM09NS-1474	8/3/2009	1	North St.	13	<i>Ochlerotatus canadensis</i>	N/S	
101	Hopkinton	CM09NS-1475	8/3/2009	1	North St.	37	<i>Coquillettidia perturbans</i>	N/S	
102	Hopkinton	CM09NS-1476	8/3/2009	1	North St.	2	<i>Psorophora ferox</i>	N/S	
103	Hopkinton	CM09NS-1477	8/3/2009	1	North St.	1	<i>Anopheles punctipennis</i>	N/S	
104	Hopkinton	CM09NS-1478	8/3/2009	1	North St.	3	<i>Ochlerotatus hendersoni</i>	N/S	
105	Hopkinton	CM09NS-1479	8/3/2009	1	North St.	1	<i>Ochlerotatus trivittatus</i>	N/S	
106	Hopkinton	CM09NS-1480	8/3/2009	1	North St.	1	<i>Ochlerotatus triseriatus</i>	N/S	
107	Hopkinton	CM09NS-1481	8/3/2009	1	North St.	2	<i>Ochlerotatus excrucians</i>	N/S	
108	Hopkinton	CM09NS-1511	8/3/2009	1	Wood St.	1	<i>Culiseta melanura</i>	N/S	

HOPKINTON SURVEILLANCE DATA  
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
109	Hopkinton	CM09NS-1512	8/3/2009	1	Wood St.	17	<i>Psorophora ferox</i>	N/S	
110	Hopkinton	CM09NS-1513	8/3/2009	1	Wood St.	14	<i>Ochlerotatus hendersoni</i>	N/S	
111	Hopkinton	CM09NS-1514	8/3/2009	1	Wood St.	54	<i>Coquillettidia perturbans</i>	N/S	
112	Hopkinton	CM09NS-1515	8/3/2009	1	Wood St.	1	<i>Anopheles quadrimaculatus</i>	N/S	
113	Hopkinton	CM09NS-1516	8/3/2009	1	Wood St.	16	<i>Ochlerotatus canadensis</i>	N/S	
114	Hopkinton	CM09NS-1517	8/3/2009	1	Wood St.	1	<i>Aedes vexans</i>	N/S	
115	Hopkinton	CM09-0248	8/5/2009	1	Wood St.	38	<i>Culex species</i>	WNV & EEE	Negative
116	Hopkinton	CM09-0249	8/5/2009	1	Wood St.	8	<i>Culex species</i>	WNV & EEE	Negative
117	Hopkinton	CM09-0296	8/13/2009	2	Joseph Rd.	16	<i>Culex species</i>	WNV & EEE	Negative
118	Hopkinton	CM09NS-1766	8/13/2009	2	Joseph Rd.	1	<i>Anopheles punctipennis</i>	N/S	
119	Hopkinton	CM09NS-1767	8/13/2009	2	Joseph Rd.	32	<i>Ochlerotatus triseriatus</i>	N/S	
120	Hopkinton	CM09NS-1768	8/13/2009	2	Joseph Rd.	43	<i>Ochlerotatus japonicus</i>	N/S	
121	Hopkinton	CM09-0328	8/17/2009	1	Wood St.	10	<i>Culex species</i>	WNV & EEE	Negative
122	Hopkinton	CM09-0329	8/17/2009	1	North St.	10	<i>Culex species</i>	WNV & EEE	Negative
123	Hopkinton	CM09-0332	8/17/2009	1	Saddle Hill Rd.	14	<i>Culex species</i>	WNV & EEE	Negative
124	Hopkinton	CM09-0333	8/17/2009	1	Saddle Hill Rd.	12	<i>Culiseta melanura</i>	WNV & EEE	Negative
125	Hopkinton	CM09-0336	8/17/2009	2	Main St.	25	<i>Culex species</i>	WNV & EEE	Negative
126	Hopkinton	CM09NS-1841	8/17/2009	1	Wood St.	2	<i>Culiseta melanura</i>	N/S	
127	Hopkinton	CM09NS-1842	8/17/2009	1	Wood St.	1	<i>Ochlerotatus canadensis</i>	N/S	
128	Hopkinton	CM09NS-1843	8/17/2009	1	Wood St.	1	<i>Anopheles barberi</i>	N/S	
129	Hopkinton	CM09NS-1844	8/17/2009	1	Wood St.	3	<i>Psorophora ferox</i>	N/S	
130	Hopkinton	CM09NS-1845	8/17/2009	1	Wood St.	12	<i>Ochlerotatus hendersoni</i>	N/S	
131	Hopkinton	CM09NS-1846	8/17/2009	1	Wood St.	24	<i>Coquillettidia perturbans</i>	N/S	
132	Hopkinton	CM09NS-1847	8/17/2009	1	North St.	3	<i>Ochlerotatus canadensis</i>	N/S	
133	Hopkinton	CM09NS-1848	8/17/2009	1	North St.	2	<i>Aedes vexans</i>	N/S	
134	Hopkinton	CM09NS-1849	8/17/2009	1	North St.	3	<i>Psorophora ferox</i>	N/S	
135	Hopkinton	CM09NS-1850	8/17/2009	1	North St.	1	<i>Anopheles punctipennis</i>	N/S	
136	Hopkinton	CM09NS-1851	8/17/2009	1	North St.	2	<i>Aedes cinereus</i>	N/S	
137	Hopkinton	CM09NS-1852	8/17/2009	1	North St.	3	<i>Ochlerotatus hendersoni</i>	N/S	
138	Hopkinton	CM09NS-1853	8/17/2009	1	North St.	13	<i>Coquillettidia perturbans</i>	N/S	
139	Hopkinton	CM09NS-1891	8/17/2009	1	Saddle Hill Rd.	4	<i>Culiseta morsitans</i>	N/S	
140	Hopkinton	CM09NS-1892	8/17/2009	1	Saddle Hill Rd.	62	<i>Coquillettidia perturbans</i>	N/S	
141	Hopkinton	CM09NS-1893	8/17/2009	1	Saddle Hill Rd.	1	<i>Anopheles punctipennis</i>	N/S	
142	Hopkinton	CM09NS-1894	8/17/2009	1	Saddle Hill Rd.	22	<i>Ochlerotatus canadensis</i>	N/S	
143	Hopkinton	CM09NS-1895	8/17/2009	1	Saddle Hill Rd.	2	<i>Aedes cinereus</i>	N/S	
144	Hopkinton	CM09NS-1896	8/17/2009	1	Saddle Hill Rd.	1	<i>Ochlerotatus hendersoni</i>	N/S	

HOPKINTON SURVEILLANCE DATA  
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
145	Hopkinton	CM09NS-1925	8/17/2009	2	Main St.	11	<i>Ochlerotatus japonicus</i>	N/S	
146	Hopkinton	CM09-0424	8/26/2009	5	Saddle Hill Rd.	7	<i>Culiseta melanura</i>	WNV & EEE	Negative
147	Hopkinton	CM09NS-2306	8/26/2009	5	Saddle Hill Rd.	2	<i>Culex species</i>	N/S	
148	Hopkinton	CM09NS-2307	8/26/2009	5	Saddle Hill Rd.	1	<i>Anopheles punctipennis</i>	N/S	
149	Hopkinton	CM09-0419	8/27/2009	2	Joseph Rd.	7	<i>Culex species</i>	WNV & EEE	Negative
150	Hopkinton	CM09NS-2279	8/27/2009	2	Joseph Rd.	17	<i>Ochlerotatus japonicus</i>	N/S	
151	Hopkinton	CM09NS-2280	8/27/2009	2	Joseph Rd.	23	<i>Ochlerotatus triseriatus</i>	N/S	
152	Hopkinton	CM09NS-2281	8/27/2009	2	Joseph Rd.	1	<i>Culiseta melanura</i>	N/S	
153	Hopkinton	CM09NS-2282	8/27/2009	2	Joseph Rd.	1	<i>Ochlerotatus canadensis</i>	N/S	
154	Hopkinton	CM09NS-2283	8/27/2009	2	Joseph Rd.	1	<i>Anopheles quadrimaculatus</i>	N/S	
155	Hopkinton	CM09NS-2284	8/27/2009	2	Joseph Rd.	1	<i>Uranotaenia sapphirina</i>	N/S	
156	Hopkinton	CM09-0437	8/31/2009	2	Main St.	14	<i>Culex species</i>	WNV & EEE	Negative
157	Hopkinton	CM09NS-2341	8/31/2009	2	Main St.	21	<i>Ochlerotatus japonicus</i>	N/S	
158	Hopkinton	CM09NS-2342	8/31/2009	2	Main St.	3	<i>Ochlerotatus triseriatus</i>	N/S	
159	Hopkinton	CM09NS-2343	8/31/2009	2	Main St.	1	<i>Anopheles quadrimaculatus</i>	N/S	
160	Hopkinton	CM09NS-2344	8/31/2009	2	Main St.	1	<i>Anopheles punctipennis</i>	N/S	
161	Hopkinton	CM09-0450	9/1/2009	1	Wood St.	11	<i>Culex species</i>	WNV & EEE	Negative
162	Hopkinton	CM09NS-2433	9/1/2009	1	North St.	4	<i>Culex species</i>	N/S	
163	Hopkinton	CM09NS-2434	9/1/2009	1	North St.	1	<i>Culiseta melanura</i>	N/S	
164	Hopkinton	CM09NS-2435	9/1/2009	1	North St.	2	<i>Ochlerotatus canadensis</i>	N/S	
165	Hopkinton	CM09NS-2436	9/1/2009	1	North St.	2	<i>Coquillettidia perturbans</i>	N/S	
166	Hopkinton	CM09NS-2437	9/1/2009	1	North St.	3	<i>Psorophora ferox</i>	N/S	
167	Hopkinton	CM09NS-2438	9/1/2009	1	North St.	1	<i>Aedes cinereus</i>	N/S	
168	Hopkinton	CM09NS-2439	9/1/2009	1	North St.	2	<i>Ochlerotatus hendersoni</i>	N/S	
169	Hopkinton	CM09NS-2440	9/1/2009	1	North St.	8	<i>Anopheles punctipennis</i>	N/S	
170	Hopkinton	CM09NS-2441	9/1/2009	1	North St.	1	<i>Ochlerotatus trivittatus</i>	N/S	
171	Hopkinton	CM09NS-2442	9/1/2009	1	Wood St.	1	<i>Culiseta melanura</i>	N/S	
172	Hopkinton	CM09NS-2443	9/1/2009	1	Wood St.	3	<i>Psorophora ferox</i>	N/S	
173	Hopkinton	CM09NS-2444	9/1/2009	1	Wood St.	1	<i>Aedes vexans</i>	N/S	
174	Hopkinton	CM09NS-2445	9/1/2009	1	Wood St.	6	<i>Anopheles punctipennis</i>	N/S	
175	Hopkinton	CM09NS-2446	9/1/2009	1	Wood St.	3	<i>Anopheles quadrimaculatus</i>	N/S	
176	Hopkinton	CM09NS-2447	9/1/2009	1	Wood St.	11	<i>Ochlerotatus hendersoni</i>	N/S	
177	Hopkinton	CM09-0453	9/2/2009	5	Saddle Hill Rd.	5	<i>Culiseta melanura</i>	WNV & EEE	Negative
178	Hopkinton	CM09NS-2454	9/2/2009	5	Saddle Hill Rd.	1	<i>Culex species</i>	N/S	
179	Hopkinton	CM09NS-2455	9/2/2009	5	Saddle Hill Rd.	1	<i>Anopheles quadrimaculatus</i>	N/S	
180	Hopkinton	CM09-0495	9/10/2009	2	Joseph Rd.	7	<i>Ochlerotatus triseriatus</i>	WNV & EEE	Negative

HOPKINTON SURVEILLANCE DATA  
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
181	Hopkinton	CM09NS-2657	9/10/2009	2	Joseph Rd.	4	<i>Culex species</i>	N/S	
182	Hopkinton	CM09NS-2658	9/10/2009	2	Joseph Rd.	5	<i>Ochlerotatus japonicus</i>	N/S	
183	Hopkinton	CM09-0508	9/14/2009	2	Main St.	29	<i>Ochlerotatus japonicus</i>	WNV & EEE	Negative
184	Hopkinton	CM09-0511	9/14/2009	1	Saddle Hill Rd.	20	<i>Culiseta melanura</i>	WNV & EEE	Negative
185	Hopkinton	CM09NS-2755	9/14/2009	2	Main St.	7	<i>Ochlerotatus triseriatus</i>	N/S	
186	Hopkinton	CM09NS-2756	9/14/2009	2	Main St.	1	<i>Anopheles punctipennis</i>	N/S	
187	Hopkinton	CM09NS-2775	9/14/2009	1	Saddle Hill Rd.	1	<i>Culex species</i>	N/S	
188	Hopkinton	CM09NS-2776	9/14/2009	1	Saddle Hill Rd.	3	<i>Ochlerotatus canadensis</i>	N/S	
189	Hopkinton	CM09NS-2777	9/14/2009	1	Saddle Hill Rd.	2	<i>Ochlerotatus hendersoni</i>	N/S	
190	Hopkinton	CM09NS-2778	9/14/2009	1	Saddle Hill Rd.	1	<i>Psorophora ferox</i>	N/S	
191	Hopkinton	CM09NS-2779	9/14/2009	1	Saddle Hill Rd.	3	<i>Anopheles punctipennis</i>	N/S	
192	Hopkinton	CM09NS-2853	9/15/2009	1	North St.	2	<i>Culiseta melanura</i>	N/S	
193	Hopkinton	CM09NS-2854	9/15/2009	1	North St.	2	<i>Ochlerotatus canadensis</i>	N/S	
194	Hopkinton	CM09NS-2855	9/15/2009	1	North St.	1	<i>Coquillettidia perturbans</i>	N/S	
195	Hopkinton	CM09NS-2856	9/15/2009	1	North St.	1	<i>Ochlerotatus hendersoni</i>	N/S	
196	Hopkinton	CM09NS-2857	9/15/2009	1	North St.	1	<i>Psorophora ferox</i>	N/S	
197	Hopkinton	CM09NS-3021	9/24/2009	2	Joseph Rd.	2	<i>Culex species</i>	N/S	
198	Hopkinton	CM09NS-3022	9/24/2009	2	Joseph Rd.	8	<i>Ochlerotatus japonicus</i>	N/S	
199	Hopkinton	CM09NS-3023	9/24/2009	2	Joseph Rd.	8	<i>Ochlerotatus triseriatus</i>	N/S	
200	Hopkinton	CM09-0567	9/28/2009	2	Main St.	19	<i>Ochlerotatus japonicus</i>	WNV & EEE	Negative
201	Hopkinton	CM09-0569	9/28/2009	1	Saddle Hill Rd.	21	<i>Culiseta melanura</i>	WNV & EEE	Negative
202	Hopkinton	CM09NS-3048	9/28/2009	2	Main St.	2	<i>Culex species</i>	N/S	
203	Hopkinton	CM09NS-3057	9/28/2009	1	Saddle Hill Rd.	2	<i>Ochlerotatus canadensis</i>	N/S	
204	Hopkinton	CM09NS-3058	9/28/2009	1	Saddle Hill Rd.	2	<i>Anopheles punctipennis</i>	N/S	
205	Hopkinton	CM09NS-3134	9/29/2009	1	Wood St.	1	<i>Culiseta melanura</i>	N/S	
206	Hopkinton	CM09NS-3135	9/29/2009	1	Wood St.	3	<i>Ochlerotatus triseriatus</i>	N/S	
207	Hopkinton	CM09NS-3233	10/8/2009	2	Joseph Rd.	3	<i>Ochlerotatus japonicus</i>	N/S	
208	Hopkinton	CM09NS-3234	10/8/2009	2	Joseph Rd.	1	<i>Ochlerotatus triseriatus</i>	N/S	
		<b>208 collections</b>				<b>2264</b>	<b>mosquitoes collected</b>		
		<b>27 collections submitted for testing</b>				<b>645</b>	<b>submitted for testing</b>		
		<b>NO VIRUS IDENTIFIED IN 2009</b>				<b>N/S=not submitted for testing</b>			

## 2009 SUMMARY

The Central Massachusetts Mosquito Control Project (the Project) currently provides its services to 38 cities and towns throughout Middlesex and Worcester Counties. The Project's headquarters is located at 111 Otis Street, Northboro, MA. Tours of the headquarters or visits to field work sites may be arranged by calling the office in advance. Please call (508) 393-3055 during business hours for more information. The Project practices Integrated Pest Management (IPM), blending state of the art methods and techniques with expertise, experience, and scientific research to provide our member communities with environmentally sound and cost effective mosquito control.

During 2009 the Project received thirteen thousand, six hundred and fourteen (13,614) requests for service from town residents and officials. Ten thousand, nine hundred and ninety (10,990) pounds of Bti (*Bacillus thuringiensis israelensis*) was applied by helicopter over two thousand, one hundred and ninety eight (2,198) acres in 3 towns, Chelmsford, Billerica & Boxborough, and six thousand, three hundred and forty seven (6,347) pounds by hand over one thousand, two hundred and sixty nine (1,269) acres throughout our service area were applied to area wetlands to reduce the emergence of adult mosquitoes. This represents over three thousand, four hundred and sixty seven (3,467) acres of wetland that was treated with this mosquito-specific bacterium, significantly reducing adult mosquito populations in these areas. Twenty nine thousand, eight hundred and forty six (29,846) catch basins were treated with larvicidal product to control the mosquitoes that seek out these cool dark wet areas to breed, including the *Culex* mosquito, a major target for West Nile Virus transmission. Three thousand, two hundred and twenty six (3,226) culverts were cleaned in an attempt to eliminate unnecessary standing water and reduce mosquito breeding. This work was done in conjunction with cleaning, clearing, and digging of one hundred and thirty six thousand, eighteen (136,018) feet of streams, brooks and ditches. This represents over twenty five and a half (25.7) miles of waterways which were cleaned and improved by Project personnel in 2009.

The Mosquito Awareness Program which we offer to elementary schools and other civic organizations in our district has become very popular. Project staff meets with students, teachers or concerned residents to discuss mosquito biology, mosquito habitat, and control procedures. Much of the presentation is directed towards what children and their families can do to prevent mosquitoes from breeding around their homes. Slides, videos, coloring books and other handouts make this an interesting program. This program is tailored to meet the needs of the specific audience. In 2009, CMMCP laboratory personnel and other administrative staff made sixty three (63) educational presentations before one thousand, nine hundred and eighty six (1,986) students in fifteen (15) Elementary schools and ten (10) members of a rotary club. CMMCP gave a presentation on our program to 12 Clarke University students in the Clarke Vector Ecology program and exhibited at two (2) health fairs.

As part of our effort to reduce the need for pesticides we continue to expand our wetlands restoration program. By cleaning clogged and overgrown waterways, mosquito breeding can be reduced and drainage areas are restored to historic conditions.

Bti mosquito larvicide is used to treat areas where mosquito larvae are found. We routinely check known breeding sites kept in our database, but also encourage the public to notify us of any areas they suspect could breed mosquitoes. Our field crews will investigate all such requests and treat the area only if surveillance gathered at the time shows an imminent threat of mosquito emergence.

Our goal is to manage all mosquito problems with education, wetlands restoration or larviciding, but we recognize that there are times when adult mosquito spraying is the only viable solution. In such cases specific areas are treated with either hand-held or pickup truck mounted sprayers if surveillance gathered at the time exceeds a pre-determined threshold to warrant an application. This program is offered on a **request-only** basis, and the exclusion process allows residents and/or town officials to exclude areas under their control from this or any part of our program.

The Project's surveillance program monitors adult mosquito and larval population density, and is the backbone for prescribing various control techniques. Specialized mosquito traps are deployed throughout the Project's service area to sample for mosquitoes that may be transmitting mosquito-borne diseases. In conjunction with the Mass. Dept. of Public Health we sample in areas suspected of harboring WNV and other viruses. Six hundred and six (606) pools (collections) of mosquitoes totaling thirteen thousand seven hundred and ninety one (13,791) specimens were tested for mosquito-borne viruses this year. Six (6) collections were identified positive with mosquito-borne viruses, three (3) with West Nile Virus (WNV) and three (3) with Eastern Equine Encephalitis (EEE) - details are available in the Medical Entomology report in this document. No human cases of EEE or WNV were identified in our

service area. CMMCP lab personnel made one thousand, five hundred and sixty five (1,565) total collections of mosquitoes containing thirty seven thousand, two hundred and thirty (37,230) individual specimens, representing twenty six (26) mosquito species.

Some additional highlights from 2009:

- Resistance management study; no significant resistance to pyrethroids noted, no change recommended in adulticide material choice (see full report).
- Resident satisfaction survey: conclusion; overall satisfaction with the adulticide program was 92%, 98% plan to use our services again (see full report).
- Host seeking study to determine the prevalent time frame mammal-biting species are seeking bloodmeals; this information will determine the best time for adulticide applications (see abstract).
- Working with Tufts Veterinary Hospital to measure effects of adulticide program on non-target effects; no conclusion as of yet, multi year study begun in late 2007.
- Working with CT Agr. Experiment Station to determine host preference of *Culiseta melanura* by collecting and analyzing DNA of blood meals; results expected soon.
- We have been awarded PESP status by the US EPA again this year. The Pesticide Environmental Stewardship Program (PESP) is a voluntary program that forms partnerships between the EPA and pesticide users to reduce the potential health and environmental risks that may be associated with pesticide use.

Educational pamphlets are available to anyone interested in learning about mosquito control and the services provided by the Project, and these items are routinely stocked in member Town/City Halls and libraries. Display boards with information on our program are rotated through area Town Halls throughout the year. We also have a website, [www.cmmcp.org](http://www.cmmcp.org) that has extensive information on mosquito biology, our control procedures, etc. This website has become a model for other Mosquito Projects and has been widely used throughout our service area and beyond.

We would like to thank you for your support during 2009 and we look forward to helping you and your community with its mosquito problems in 2010 and beyond.

Respectfully submitted,  
Timothy D. Deschamps, Executive Director

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