THE COMMONWEALTH OF MASSACHUSETTS
STATE RECLAMATION & MOSQUITO CONTROL BOARD

CENTRAL MASSACHUSETTS MOSQUITO CONTROL PROJECT

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ANNUAL REPORT 2009

printed on minimum 30% post-consumer content

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** 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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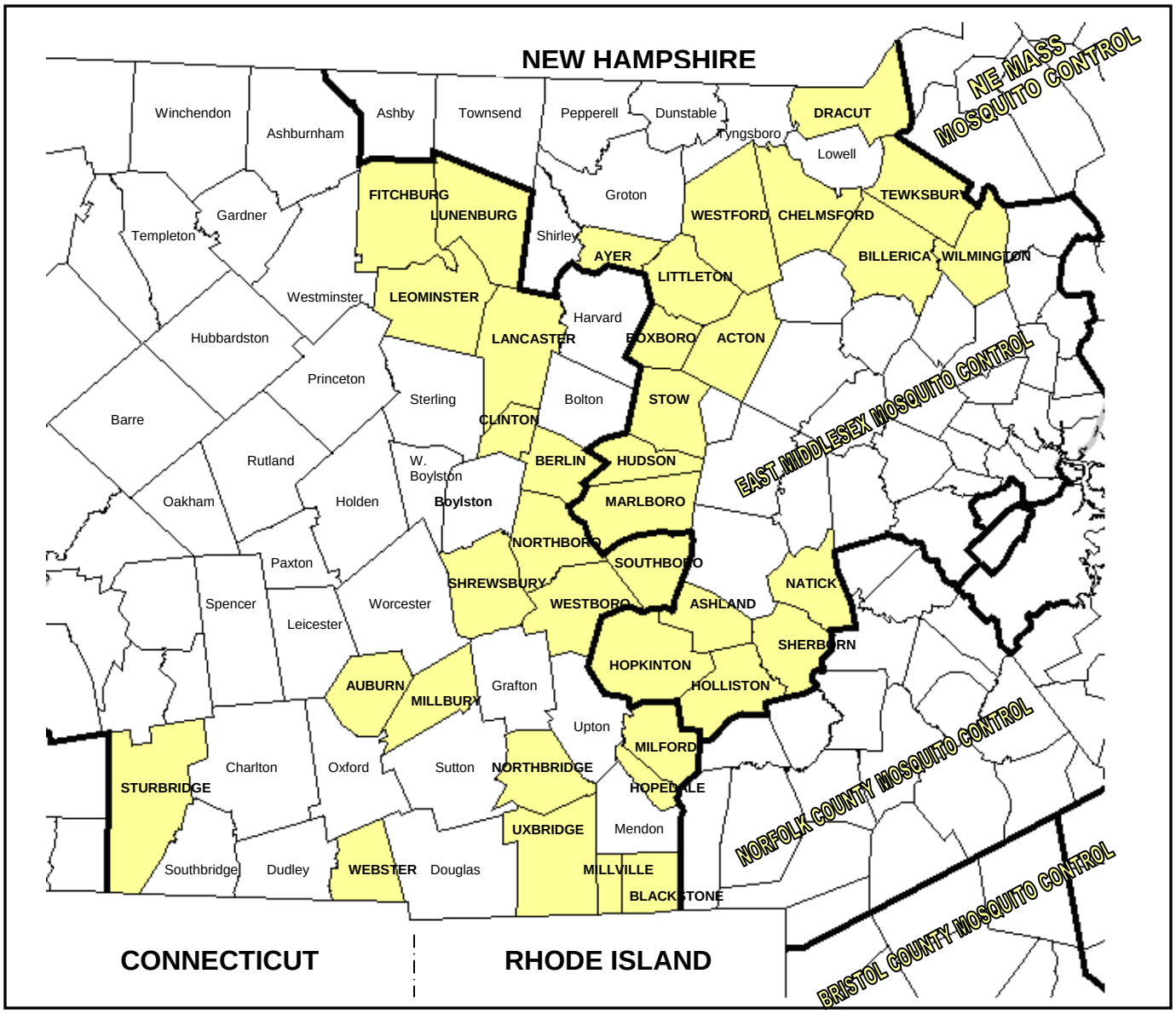
millet@cmmcp.org

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



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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.

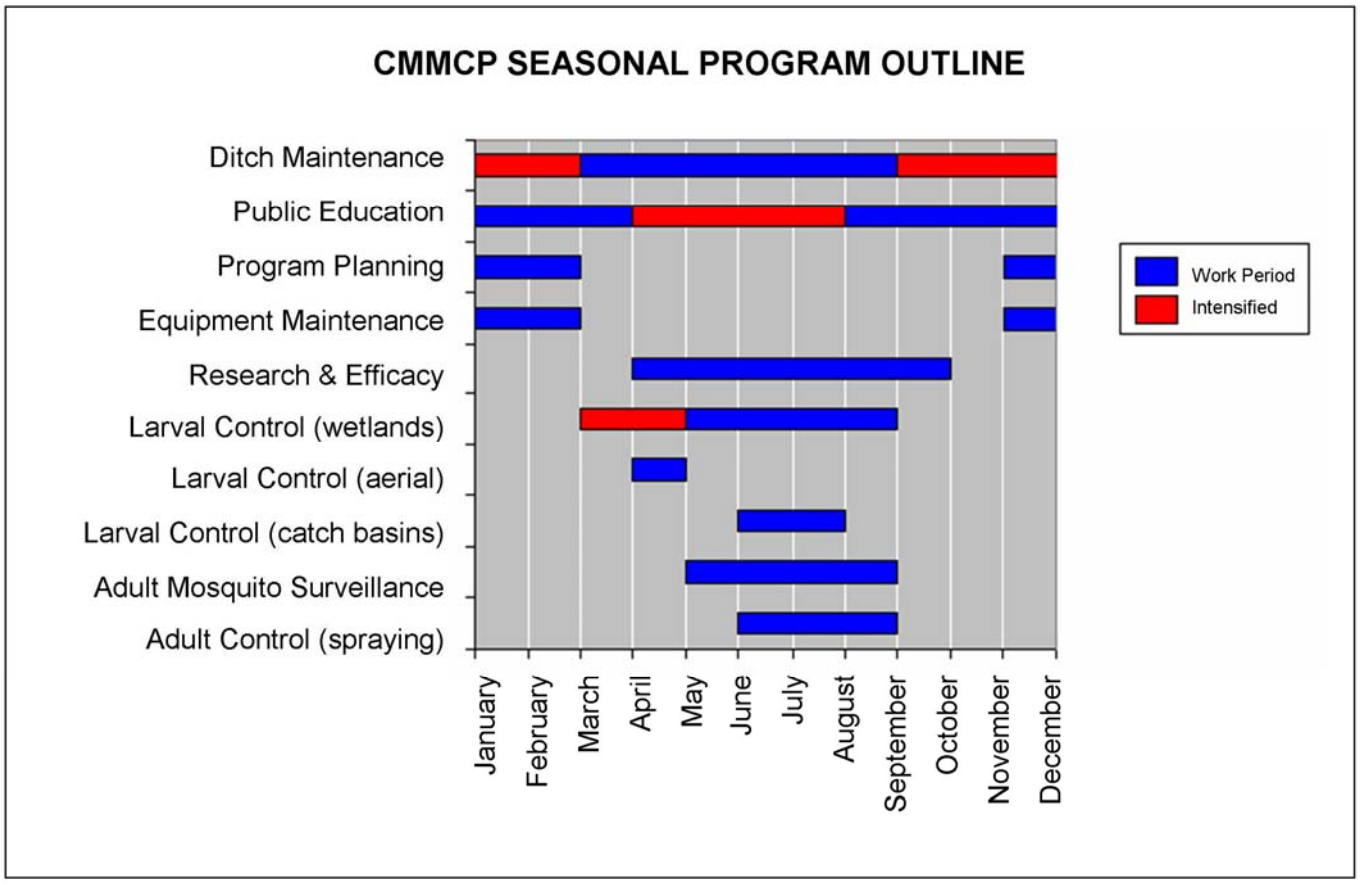
PROGRAM EVALUATION

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	*Culex species*	Westborough	WNV	Positive
8/6/2009	*Culex species*	Westford	WNV	Positive
9/2/2009	*Culex species*	Shrewsbury	WNV	Positive
9/22/2009	*Culiseta melanura*	Webster	EEE	Positive
9/22/2009	*Culiseta melanura*	Leominster	EEE	Positive
10/9/2009	*Culiseta melanura*	Webster	EEE	Positive

WNV Surveillance Summary – **Statewide**	2009
Mosquito Pools Positive	26
Animals Positive	1
Humans Positive	0
EEE Surveillance Summary – **Statewide**	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 55th 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

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 accepts request 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 resident 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 (multiples 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	

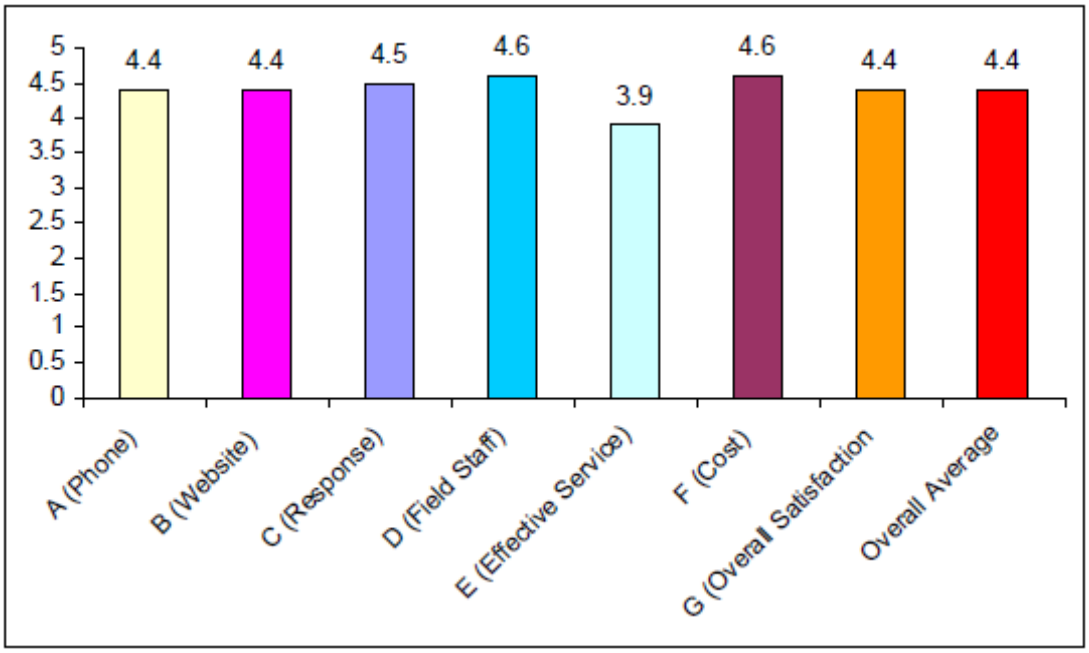
Please rate our performance for 2009 from 0 to 5, where 5 is the best rating, 0 is the worst rating:

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
Total satisfaction rating: 8,487 points out of 9,610 possible – 4.41 average		

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[1]. 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

[1]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 morality 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_2 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)

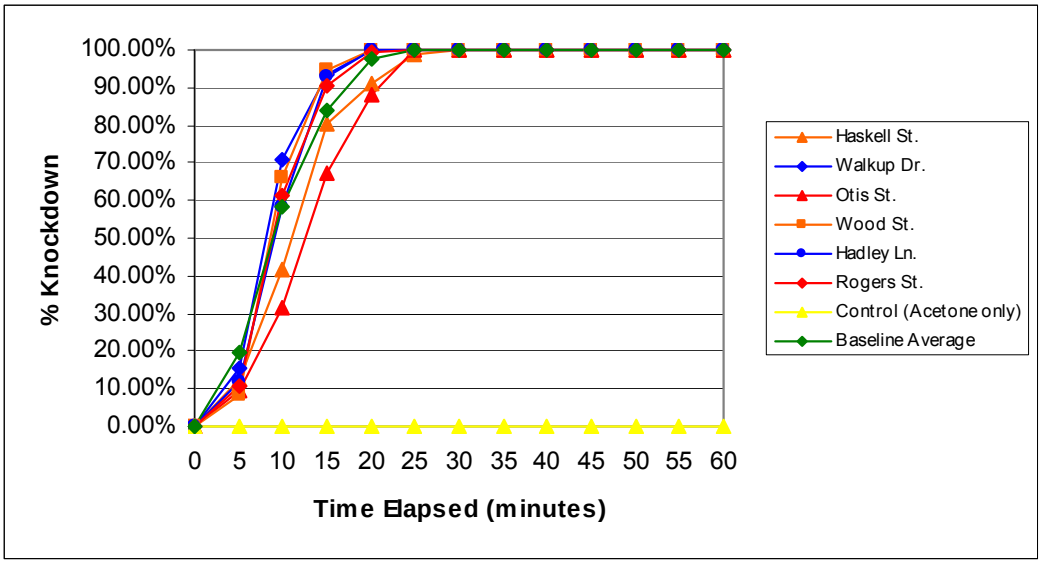
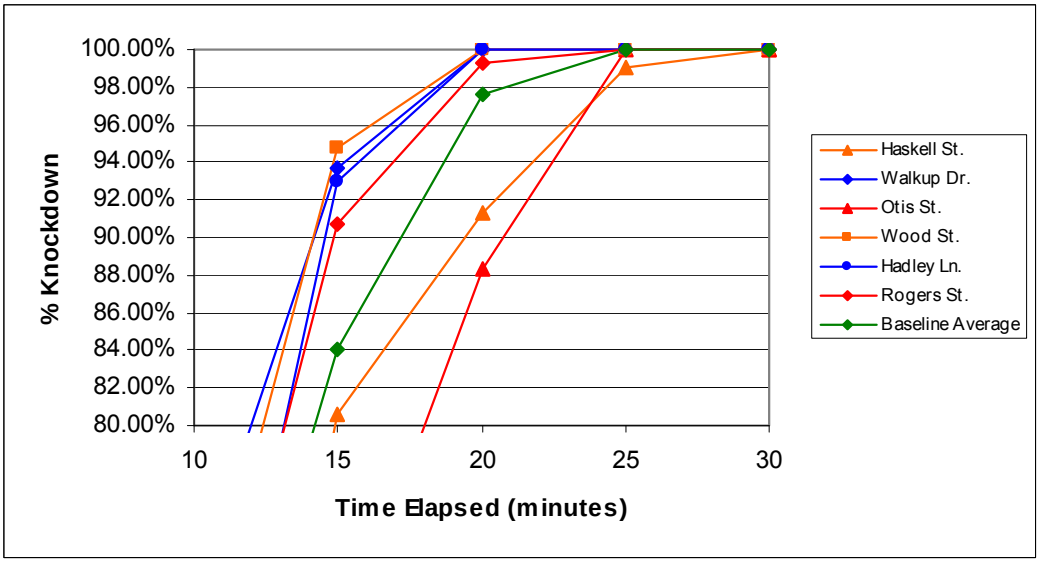


Figure 2: 2007 Time-% Knockdown Curves of Bottle Assays (2) for ANVIL® 10+10 (22.17µg/ml)



The bottle assays preformed 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)

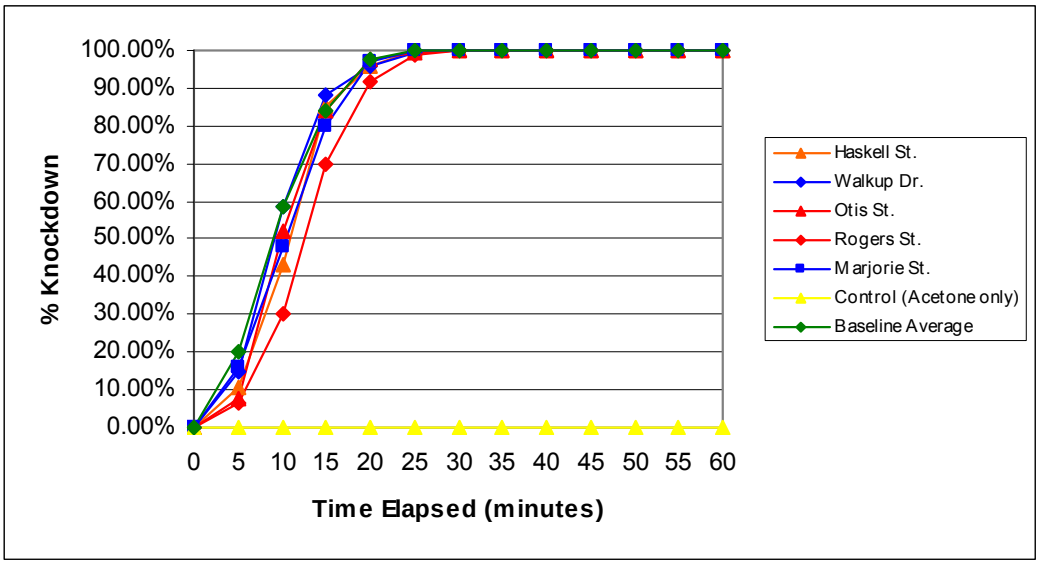
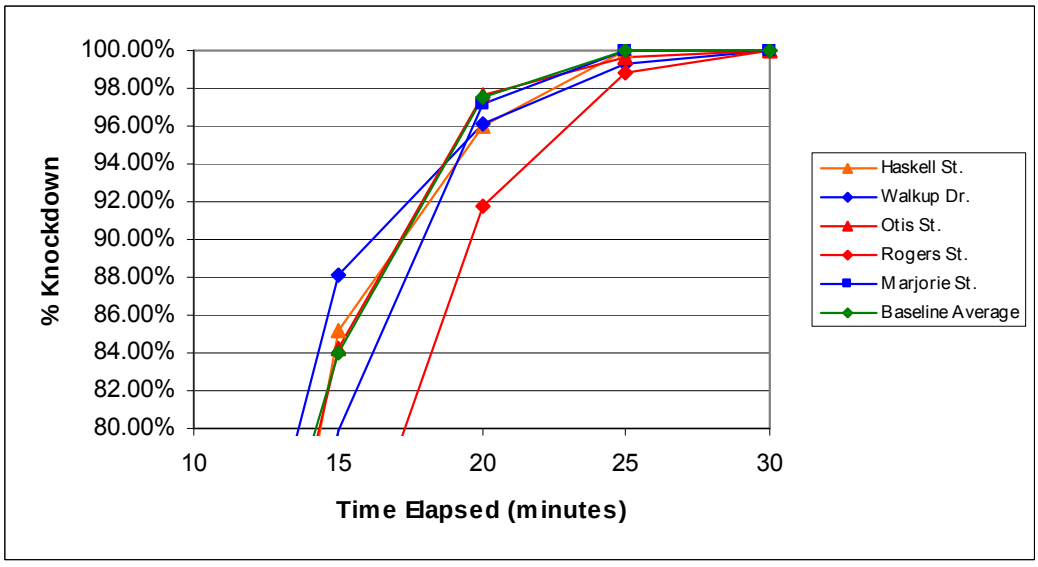


Figure 4: 2008 Time-% Knockdown Curves of Bottle Assays (2) for ANVIL® 10+10 (22.17µg/ml)



Bottle assays preformed 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)

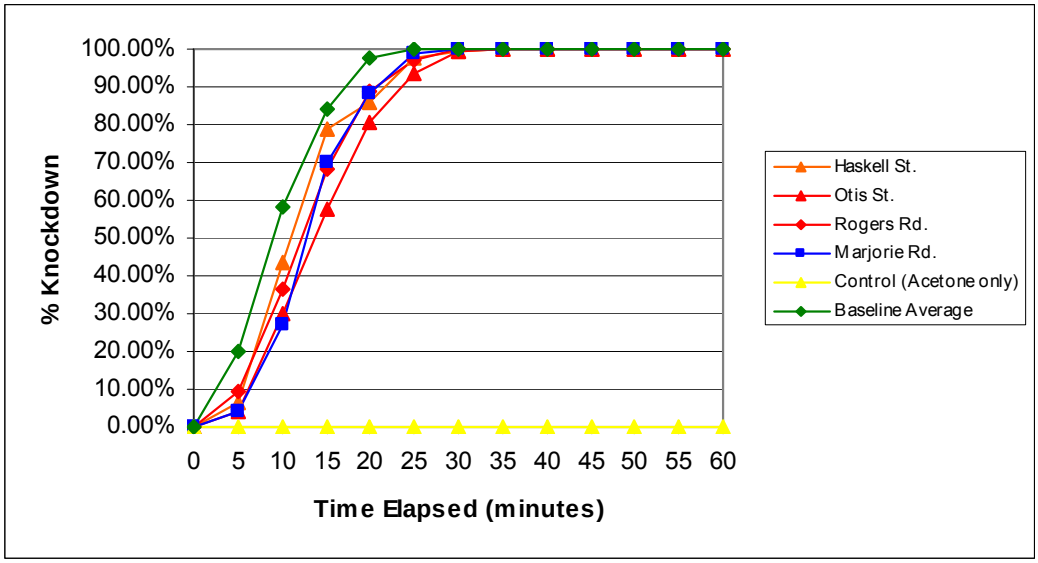
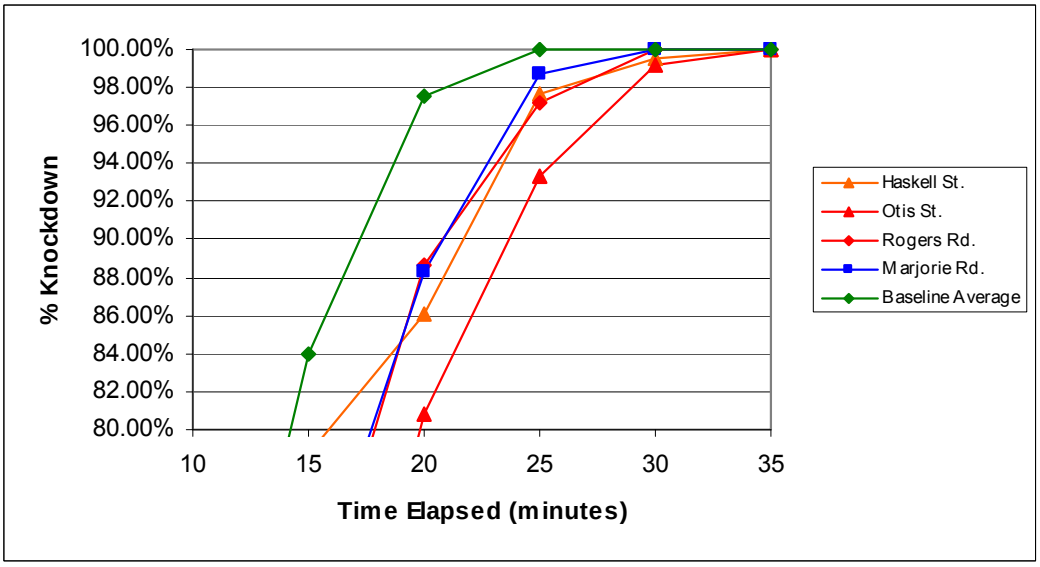
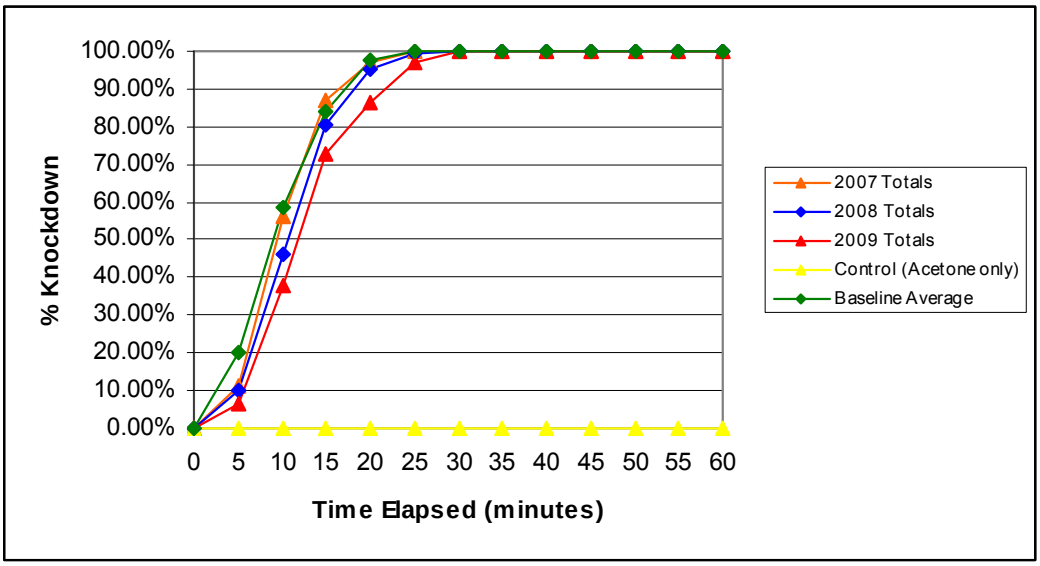


Figure 6: 2009 Time-% Knockdown Curves of Bottle Assays (2) for ANVIL® 10+10 (22.17µg/ml)



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

I would like to thank the following people and groups for their help and guidance throughout this project: Timothy Deschamps, Timothy McGlinchy, Ann Meyer, Justin Covino and The Central Mass. Mosquito Control Project Commissioners

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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 WEBSTER

DATE	WORK DONE	LOCATION
02-03-09	Administrative	GPS Coordinates – No Spray
02-05-09	Administrative	GPS Coordinates – No Spray
02-19-09	Administrative Contact	Board of Health
03-23-09	Larviciding	Lower Gore Road
	Larval Survey	Old Douglas Road, Lower Gore Road, Wawela Road, Scenic Avenue, Wakefield Avenue, Freeman Avenue, Upper Gore Road, Skyview Lane
03-26-09	Public Relations	Houghton Street, Golden Heights, Victory Drive, Sewer Department, Linda Street
	Trap Site Survey	Highland Street, Crystal Street, Golden Heights, Victory Drive, Slater Street, Hill Street, Houghton Street, Westwood Street, Linda Street
04-02-09	Larviciding	Nancy Drive, Tanner Road, Dragon Road, Pontiac Avenue
	Larval Survey	Nancy Drive, Victoria Drive, Tanner Road, Worcester Road, Old Worcester Road, Dragon Road, Bigelow Road, Market Street, Village Way, Victory Drive, Pontiac Avenue
04-03-09	Administrative Contact	Board of Health, Town Clerk’s Office
04-14-09	Larviciding	Town Forest Road, Viking
04-21-09	Administrative Contact	Town Clerk’s Office, Board of Health
04-25-09	Larviciding	Sutton Road
	Larval Survey	Kingsbury Road, Sutton Road, Fort Hill Road
05-04-09	Public Relations	Lakemont Road, First Street
	Larviciding	Klebart Avenue, Lake Parkway, Rodio Drive, Thompson Road, Bay View Road, Point Breeze Road
	Larval Survey	Lakemont Road, First Street, Crosby Street, Klebart Avenue, Lake Parkway, Pointe Breeze Road, Bay View Road
05-08-09	Public Relations	Market Street, Old Douglas Road
	Larviciding	Market Street, Camille Road, Henry Joseph Drive, Mine Brook Road, Rawson Road, Douglas Road, Old Douglas Road
	Larval Survey	Fort Hill Road, Henry Joseph Drive, Mine Brook Road, Rawson Road, Chestnut Hill Drive, Douglas Road, Old Douglas Road
05-13-09	Public Relations	Sutton Avenue, McGovern Lane
	Larviciding	Black Pointe Road, Patterson Road
	Larval Survey	Thompson Road, Elaine Street, Bates Grove Road, McGovern Lane, Windy Ridge Road, Brian Avenue, Thompson Road, Kosmas Street, Tower Street, Goddard Street, Lincoln Street
05-19-09	Public Relations	Konkel Avenue
	Stream Cleaning 15’	Lower Gore Road
	Larviciding	Lower Gore Road, Lakeside Avenue, Freeman Avenue, Konkel Avenue
	Larval Survey	Wawela Road, Lower Gore Road, Scenic Avenue, Wakefield Avenue, Lakeside Avenue, Freeman Avenue, Konkel Avenue, Mike’s Way, Upper Gore Road, Skyline Lane, Gore Road, Killdeer Road, South Shore Road
05-23-09	Public Relations	Sutton Road
	Larviciding	Sutton Road, Cudworth Road, Town Forest Road
	Larval Survey	Sutton Road, Fort Hill Road, Camile Road, Henry Joseph Drive, Cudworth Road
05-28-09	Administrative Contact	Board of Health
06-01-09	Set Trap	Highland Street, Westwood Street
06-02-09	Pick Up Trap	Highland Street, Westwood Street
06-11-09	Administrative Contact	Police Department
	Public Relations	Bigelow Road, Spruce Lane, Poland Street, Campbell Street
	Larval Survey	Bigelow Road, Winter Haven Drive, School Street, Riebe Avenue, Brookside Avenue, Westview Drive, Surrey Lane, Perryville Lane
	Set Up Trap	Slater Street
06-12-09	Pick Up Trap	Slater Street
06-15-09	Set Trap	Highland Street, Westwood Road
06-16-09	Pick Up Trap	Highland Street, Westwood Road

TOWN OF WEBSTER

DATE	WORK DONE	LOCATION
06-18-09	Administrative Contact	Police Department, Board of Health
	Public Relations	Spruce Lane, Poland Street, Riebe Avenue, Oscar Street, Freeman Avenue, Campbell Street, Upper Gore Road, Rawson Road, Bigelow Road, Rod & Gun Club
06-25-09	Administrative Contact	Police Department
	Public Relations	Highland Street, Riebe Avenue, Linda Street, Oscars Street, Poland Street, Spruce Lane, Bigelow Road, Freeman Avenue, Campbell Street, Upper Gore Road, Rawson Road, Sutton Road
	Adulticiding	Highland Street, Riebe Avenue, Linda Street, Oscars Street, Poland Street, Spruce Lane, Bigelow Road, Freeman Avenue, Campbell Street, Upper Gore Road, Rawson Road, Sutton Road, Sportsman Club
	Catch Basin Larviciding [50]	Highland Street, Harvard Street, Batten Street, Malden Drive, Abbey Road, Hayes Avenue, Applebee Avenue, Riebe Avenue, Grenier Avenue, Stephen Drive
	Set Up Trap	Slater Street
06-26-09	Pick Up Trap	Slater Street
06-29-09	Set Up Trap	Highland Street, Westwood Road
06-30-09	Pick Up Trap	Highland Street, Westwood Road
07-09-09	Administrative Contact	Police Department
	Public Relations	Hillside Avenue, Morris Street, Stefaniak Avenue, Eastern Avenue, Applebee Avenue, Scenic Avenue, Lakeside Avenue, Campbell Street, Freeman Avenue
	Adulticiding	Hillside Avenue, Morris Street, Stefaniak Avenue, Eastern Avenue, Applebee Avenue, Scenic Avenue, Lakeside Avenue, Campbell Street, Freeman Avenue
	Set Up Trap	Slater Street
07-10-09	Pick Up Trap	Slater Street
07-13-09	Set Up Trap	Highland Street, Westwood Road
07-14-09	Pick Up Trap	Highland Street, Westwood Road
07-16-09	Administrative Contact	Police Department, Board of Health
	Public Relations	Bigelow Road
	Adulticiding	Bigelow Road
	Larval Survey	Bigelow Road, Town Forest Road
07-23-09	Administrative Contact	Police Department
	Public Relations	Campbell Street, Abbey Road
	Catch Basin Larviciding [73]	Golden Heights, Normandy Avenue, Victory Drive, Crystal Street, Arkwright Road, Racicot Avenue, Girard Street, James Street, Upland Avenue Extension, Vecchia Street, Emil Street, Didonato Avenue, Hartley Street, Upland Avenue, Brodeur Avenue, Slater Street, Mill Street, Starzec Drive, Stoughton Avenue, Hall Street, Aldrich Street, Wakefield Street, Day Street, Church Court, Wall Street, Pearl Street, Railroad Avenue, Market Street, Genevieve Lane, Riverside Drive, Concord Court, Deerfield Drive West, Stockbridge Street, Deerfield Drive East
	Set Up Trap	Slater Street
07-24-09	Pick Up Trap	Slater Street
07-27-09	Set Up Trap	Highland Street, Westwood Road
07-28-09	Pick Up Trap	Highland Street, Westwood Road
07-30-09	Administrative Contact	Police Department
	Public Relations	Campbell Street, Gorski Avenue, Morris Street, Abbey Road, Didonato Avenue, Hartley Street, Bigelow Road, Genevieve Lane
	Adulticiding	Campbell Street, Gorski Avenue, Morris Street, Abbey Road, Didonato Avenue, Hartley Street, Bigelow Road, Genevieve Lane
07-31-09	Catch Basin Larviciding [21]	Nancy Drive, Victoria Drive, Hugo Terrace, Wilfred Lane, Marilyn Drive, Lara Terrace, Tanner Road, Cudworth Road,
	Steam Survey	Victoria Drive
08-06-09	Set Up Trap	Slater Street

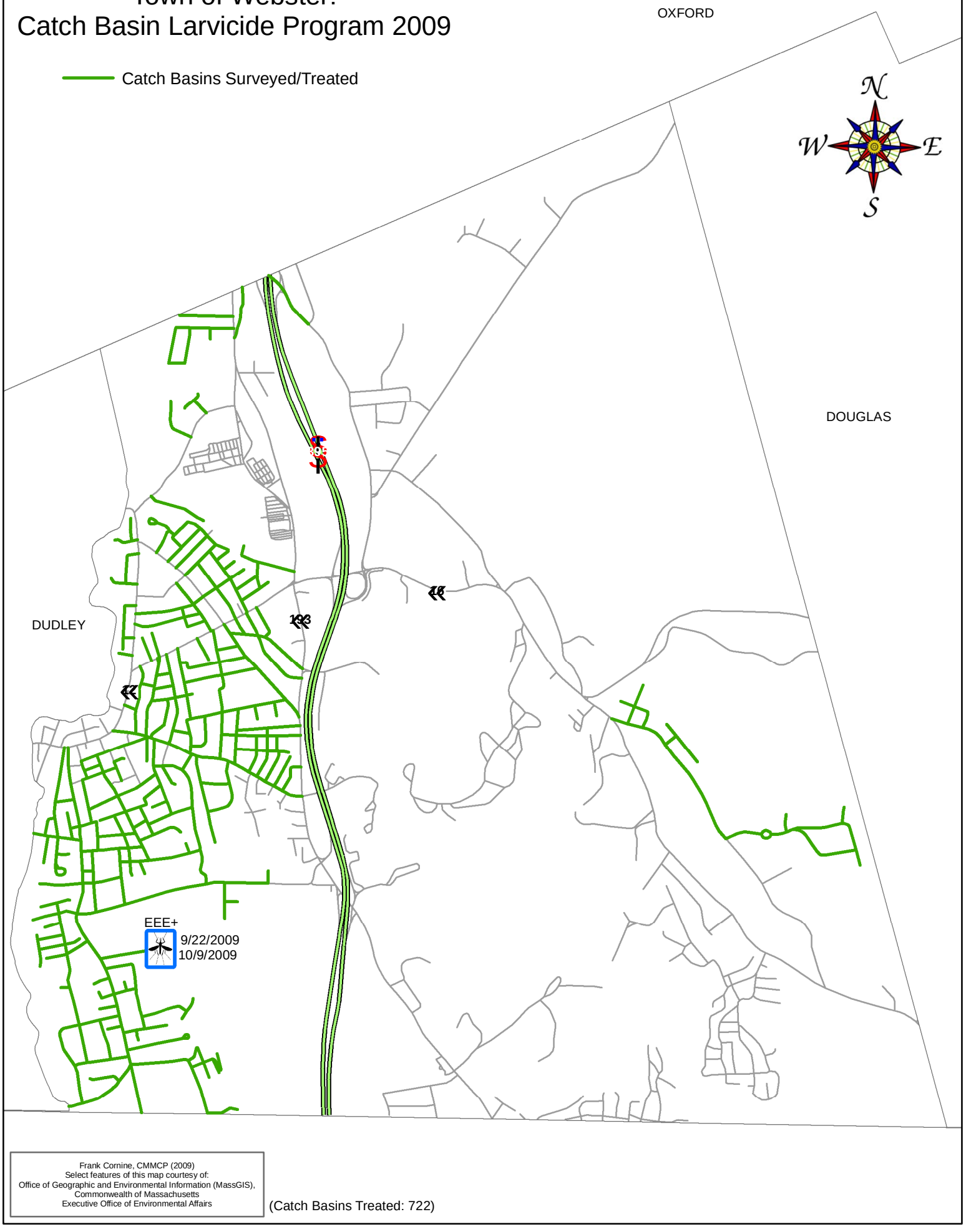
TOWN OF WEBSTER

DATE	WORK DONE	LOCATION
08-06-09	Administrative Contact	Police Department
	Public Relations	Poland Street, Didonato Avenue, Gore Gable Road, Upper Gore Road, Point Breeze Road, Bay View Road
	Adulticiding	Poland Street, Didonato Avenue, Gore Gable Road, Upper Gore Road, Point Breeze Road, Bay View Road
	Catch Basin Larviciding [45]	Upper Gore Road, Gore Cable Road, Sylvester Drive, Lepine Drive, Florence Drive, Skyview Lane, Blueberry Lane, Blueberry Hill, Blueberry Terrace, Blueberry Way, Dream Street
08-07-09	Pick Up Trap	Slater Street
08-10-09	Set Up Trap	Highland Street, Westford Road
08-11-09	Pick Up Trap	Highland Street, Westford Road
08-13-09	Public Relations	Eastern Avenue, Campbell Road, Lakeside Avenue
	Adulticiding	Eastern Avenue, Campbell Road, Lakeside Avenue
08-15-09	Catch Basin Larviciding [183]	Second Island Road, Paradis Lane, Hillside Avenue, Park Avenue, Grandview Lane, Grove Street, Morris Street, Nelson Street, Ray Street, Oak Lane, Spruce Lane, Cody Street, Memorial Park Drive, Lincoln Street, Washington Street, Maynard Street, Robinson Street, Pepka Road, Dresser Street, Tower Street, Eddy Street, Emerald Avenue, Summit Street, Everett Avenue, Greystone Avenue, Park Road, Gorski Avenue, Lake Street, Sibley Avenue, Bartlett Street, Whitcomb Street, Goddard Street, Cutler Street, Granite Street, Clark Street, Short Street, Oak Street, Prospect Street
08-20-09	Administrative Contact	Police Department
	Public Relations	Nancy Drive, Camile Road, Upper Gore Road, Mike’s Way, West Avenue, Applebee Avenue
	Adulticiding	Nancy Drive, Camile Road, Upper Gore Road, Mike’s Way, West Avenue, Applebee Avenue
	Set Up Trap	Slater Street
08-21-09	Pick Up Trap	Slater Street
08-22-09	Catch Basin Larviciding [350]	School Street, Harvard Street, Malden Drive, Grenier Avenue, Ash Street, Brookside Avenue, West Hollow Lane, Hickory Lane, Overlook Avenue, Sears Avenue, Cushing Road, Westwood Road, High Street, High Crest Park, Juniper Lane, Poland Street, First Street, Summer Street, West Avenue, Highland Street, Applebee Avenue, Abbey Road, Stephen Drive, Perryville Road, Westview Drive, Surrey Lane, Linda Street, Orchard Avenue, Winter Haven Drive, Kelly Erin Lane, Hill Street, Emmanuel Street, Lake Parkway, Klebart Avenue, Third Street, George Street, Harris Street, Stefaniak Avenue, Little League Lane, Crosby Street, Boyden Street Extension, Brook Street, Elm Street, Mt. Pleasant Street, May Street, Mechanic Street, Spring Street, Fifth Street, Myrtle Avenue, Valley Street, Maple Street, Park Street, Negus Street, Maynard Avenue
	Larviciding	Batten Street, Gia Lane, Irene Avenue, Holly Lane, Hayes Avenue, Woods Grove Drive, Rainville Avenue, Houghton Street, Carter Street, East Lane, Rodio Drive, Brandes Street, George Street Extension, Joyce Street, Lyndale Avenue, Snow Street, Meringo Avenue, Kenneway Lane, Old Thompson Road, Richard Avenue, Pine Tree Lane, Oscar Street, Riebe Avenue, Raleigh Road, Fenner Street, Day Lane, Crown Street, Cranberry Road, Vine Street, McKays Way, New Street, Fourth Street, Boyden Street, Brookline Street
08-24-09	Set Up Trap	Highland Street, Westwood Road
08-25-09	Pick Up Trap	Highland Street, Westwood Road
08-27-09	Administrative Contact	Police Department
	Public Relations	Eastern Avenue, Gore Gable Drive, Kenneth Avenue, Nancy Drive, Camile Road

TOWN OF WEBSTER

DATE	WORK DONE	LOCATION
08-27-09	Adulticiding	Eastern Avenue, Gore Gable Drive, Kenneth Avenue, Nancy Drive, Camile Road
09-03-09	Administrative Contact	Police Department
	Public Relations	Campbell Street, Upper Gore Road, Camile Road
	Adulticiding	Campbell Street, Upper Gore Road, Camile Road
	Set Up Trap	Slater Street
09-04-09	Pick Up Trap	Slater Street
09-17-09	Set Up Trap	Slater Street
09-18-09	Pick Up Trap	Slater Street
09-21-09	Set Up Trap	Westwood Road, Highland Street
09-22-09	Pick Up Trap	Westwood Road, Highland Street
10-01-09	Set Up Trap	Slater Street, Highland Street
10-02-09	Pick Up Trap	Slater Street, Highland Street
10-05-09	Set Up Trap	Westwood Road, Highland Street
10-06-09	Pick Up Trap	Westwood Road, Highland Street
	Reset Trap	Highland Street
10-07-09	Culvert Cleaning (4)	Sutton Road, Cudworth Road, Mine Brook Road, Kingsbury Road
	Pick Up Trap	Highland Street
	Reset Trap	Highland Street
10-08-09	Pick Up Trap	Highland Street
	Reset Trap	Highland Street
10-09-09	Pick Up Trap	Highland Street
10-26-09	Stream Cleaning 160’	Didonato Road
	Stream Cleaning 280’	Slater Street
	Stream Cleaning 30’	Brookside Avenue
	Culvert Cleaning (7)	Bigelow Road, Wakefield Avenue, Upper Gore Road, Wawela Park Road, Applebee Avenue, Brookside Avenue, Westview Drive
10-28-09	Administrative Contact	Assessor’s Office
11-05-09	Pick Up Trap Site	Highland Street
11-20-09	Administrative Contact	Town Clerk’s Office
11-23-09	Brush Cutting 300’	Upper Gore Road
	Stream Cleaning 300’	Upper Gore Road
11-24-09	Brush Cutting 280’	Upper Gore Road
	Stream Cleaning 280’	Upper Gore Road
11-25-09	Brush Cutting 200’	Upper Gore Road
	Stream Cleaning 125’	Old Douglas Road
	Stream Cleaning 150’	Old Douglas Road
	Stream Cleaning 50’	Old Douglas Road
	Stream Cleaning 25’	Old Douglas Road
	Stream Cleaning 50’	Douglas Road
	Culvert Cleaning (5)	Old Douglas Road, Douglas Road
11-30-09	Brush Cutting 235’	Upper Gore Road
	Stream Cleaning 235’	Upper Gore Road
12-01-09	Brush Cutting 315’	Upper Gore Road
	Stream Cleaning 315’	Upper Gore Road
12-07-09	Public Relations	Lower Gore Road
	Stream Cleaning 480’	Upper Gore Road
12-10-09	Stream Cleaning 660’	Upper Gore Road

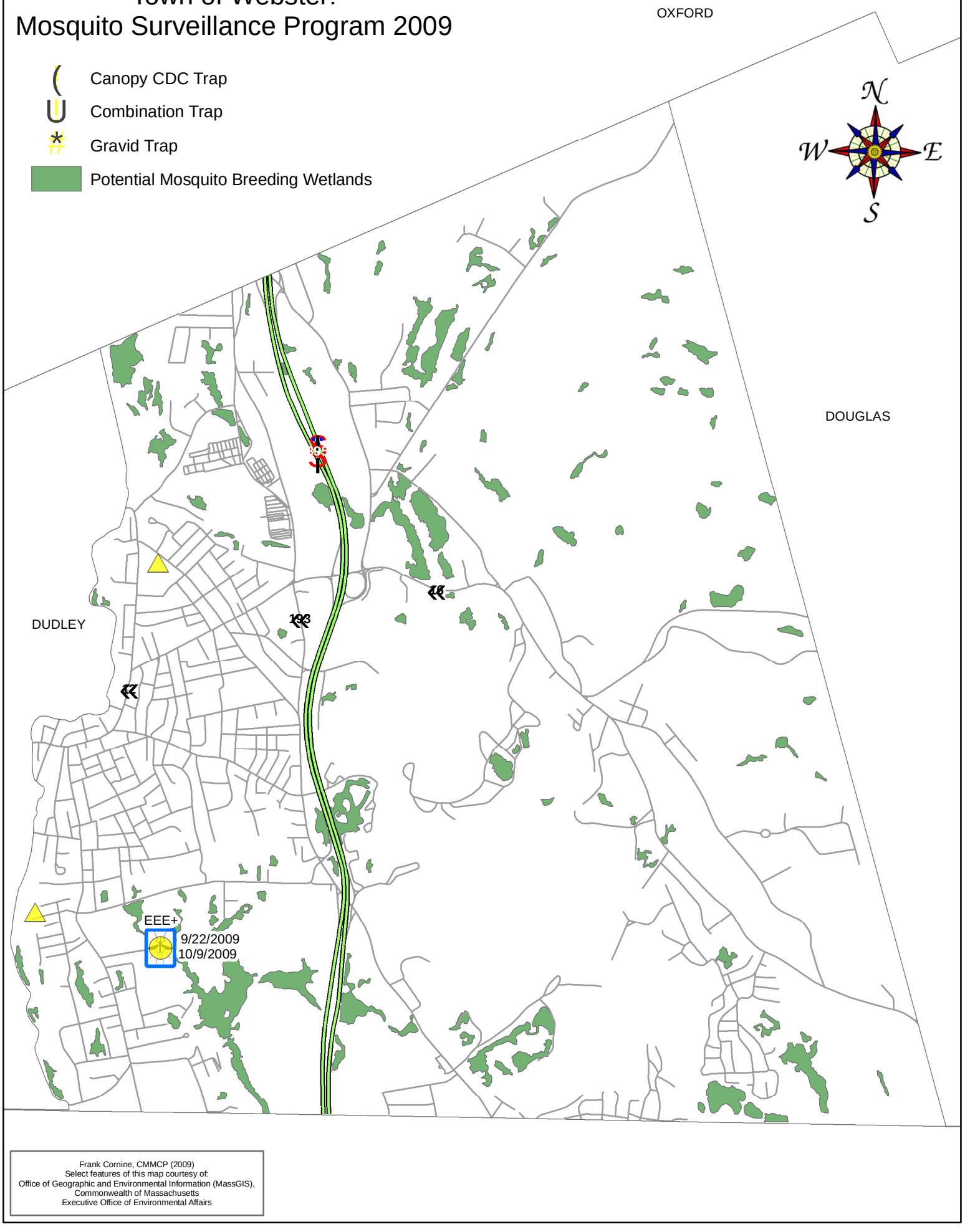
Town of Webster:
Catch Basin Larvicide Program 2009



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

(Catch Basins Treated: 722)

Town of Webster:
Mosquito Surveillance Program 2009



WEBSTER SURVEILLANCE DATA
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
1	Webster	CM09NS-0248	6/11/2009	1	Slater St.	1	*Culex species*	N/S	
2	Webster	CM09NS-0249	6/11/2009	1	Slater St.	2	*Ochlerotatus japonicus*	N/S	
3	Webster	CM09-0003	6/15/2009	1	Westwood St.	12	*Culex species*	WNV & EEE	Negative
4	Webster	CM09NS-0275	6/15/2009	1	Highland St.	1	*Culex species*	N/S	
5	Webster	CM09NS-0276	6/15/2009	1	Highland St.	7	*Culiseta melanura*	N/S	
6	Webster	CM09NS-0277	6/15/2009	1	Highland St.	24	*Coquillettidia perturbans*	N/S	
7	Webster	CM09NS-0278	6/15/2009	1	Highland St.	1	*Ochlerotatus excrucians*	N/S	
8	Webster	CM09NS-0288	6/15/2009	1	Westwood St.	4	*Ochlerotatus japonicus*	N/S	
9	Webster	CM09NS-0504	6/25/2009	1	Slater St.	1	*Culiseta melanura*	N/S	
10	Webster	CM09NS-0505	6/25/2009	1	Slater St.	1	*Ochlerotatus japonicus*	N/S	
11	Webster	CM09-0038	6/29/2009	1	Westwood St.	14	*Culex species*	WNV & EEE	Negative
12	Webster	CM09NS-0523	6/29/2009	1	Westwood St.	6	*Ochlerotatus japonicus*	N/S	
13	Webster	CM09NS-0613	6/29/2009	1	Highland St.	4	*Culex species*	N/S	
14	Webster	CM09NS-0614	6/29/2009	1	Highland St.	9	*Culiseta melanura*	N/S	
15	Webster	CM09NS-0615	6/29/2009	1	Highland St.	180	*Coquillettidia perturbans*	N/S	
16	Webster	CM09NS-0616	6/29/2009	1	Highland St.	8	*Ochlerotatus canadensis*	N/S	
17	Webster	CM09NS-0617	6/29/2009	1	Highland St.	7	*Ochlerotatus excrucians*	N/S	
18	Webster	CM09NS-0618	6/29/2009	1	Highland St.	5	*Culiseta morsitans*	N/S	
19	Webster	CM09NS-0619	6/29/2009	1	Highland St.	1	*Anopheles walkeri*	N/S	
20	Webster	CM09NS-0767	7/9/2009	1	Slater St.	1	*Culex species*	N/S	
21	Webster	CM09NS-0768	7/9/2009	1	Slater St.	5	*Ochlerotatus japonicus*	N/S	
22	Webster	CM09NS-0769	7/9/2009	1	Slater St.	1	*Ochlerotatus triseriatus*	N/S	
23	Webster	CM09NS-0778	7/13/2009	1	Westwood St.	7	*Culex species*	N/S	
24	Webster	CM09NS-0779	7/13/2009	1	Westwood St.	2	*Ochlerotatus japonicus*	N/S	
25	Webster	CM09NS-0780	7/13/2009	1	Westwood St.	1	*Ochlerotatus triseriatus*	N/S	
26	Webster	CM09NS-0783	7/13/2009	1	Highland St.	2	*Culex species*	N/S	
27	Webster	CM09NS-0784	7/13/2009	1	Highland St.	6	*Coquillettidia perturbans*	N/S	
28	Webster	CM09NS-1098	7/23/2009	1	Slater St.	5	*Ochlerotatus japonicus*	N/S	
29	Webster	CM09NS-1099	7/23/2009	1	Slater St.	1	*Culex species*	N/S	
30	Webster	CM09NS-1100	7/23/2009	1	Slater St.	1	*Ochlerotatus triseriatus*	N/S	
31	Webster	CM09-0174	7/27/2009	1	Highland St.	28	*Culex species*	WNV & EEE	Negative
32	Webster	CM09-0175	7/27/2009	1	Highland St.	12	*Culiseta melanura*	WNV & EEE	Negative
33	Webster	CM09NS-1127	7/27/2009	1	Westwood St.	7	*Ochlerotatus japonicus*	N/S	
34	Webster	CM09NS-1128	7/27/2009	1	Westwood St.	2	*Ochlerotatus triseriatus*	N/S	
35	Webster	CM09NS-1166	7/27/2009	1	Highland St.	192	*Coquillettidia perturbans*	N/S	
36	Webster	CM09NS-1167	7/27/2009	1	Highland St.	8	*Aedes cinereus*	N/S	
37	Webster	CM09NS-1168	7/27/2009	1	Highland St.	1	*Anopheles quadrimaculatus*	N/S	

WEBSTER SURVEILLANCE DATA
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
38	Webster	CM09NS-1169	7/27/2009	1	Highland St.	4	*Ochlerotatus excrucians*	N/S	
39	Webster	CM09NS-1170	7/27/2009	1	Highland St.	17	*Ochlerotatus canadensis*	N/S	
40	Webster	CM09NS-1171	7/27/2009	1	Highland St.	1	*Anopheles punctipennis*	N/S	
41	Webster	CM09NS-1172	7/27/2009	1	Highland St.	5	*Aedes vexans*	N/S	
42	Webster	CM09NS-1173	7/27/2009	1	Highland St.	13	*Ochlerotatus triseriatus*	N/S	
43	Webster	CM09NS-1174	7/27/2009	1	Highland St.	6	*Ochlerotatus trivittatus*	N/S	
44	Webster	CM09-0257	8/6/2009	2	Slater St.	16	*Culex species*	WNV & EEE	Negative
45	Webster	CM09NS-1553	8/6/2009	2	Slater St.	9	*Ochlerotatus japonicus*	N/S	
46	Webster	CM09NS-1554	8/6/2009	2	Slater St.	7	*Ochlerotatus triseriatus*	N/S	
47	Webster	CM09NS-1555	8/6/2009	2	Slater St.	1	*Aedes cinereus*	N/S	
48	Webster	CM09-0271	8/10/2009	1	Highland St.	8	*Culex species*	WNV & EEE	Negative
49	Webster	CM09-0272	8/10/2009	2	Westwood St.	44	*Culex species*	WNV & EEE	Negative
50	Webster	CM09NS-1621	8/10/2009	1	Highland St.	1	*Culiseta melanura*	N/S	
51	Webster	CM09NS-1622	8/10/2009	1	Highland St.	2	*Psorophora ferox*	N/S	
52	Webster	CM09NS-1623	8/10/2009	1	Highland St.	1	*Aedes cinereus*	N/S	
53	Webster	CM09NS-1624	8/10/2009	1	Highland St.	31	*Coquillettidia perturbans*	N/S	
54	Webster	CM09NS-1625	8/10/2009	1	Highland St.	3	*Ochlerotatus hendersoni*	N/S	
55	Webster	CM09NS-1626	8/10/2009	2	Westwood St.	6	*Ochlerotatus japonicus*	N/S	
56	Webster	CM09NS-1627	8/10/2009	2	Westwood St.	4	*Ochlerotatus triseriatus*	N/S	
57	Webster	CM09NS-1628	8/10/2009	2	Westwood St.	1	*Aedes cinereus*	N/S	
58	Webster	CM09NS-1629	8/10/2009	2	Westwood St.	1	*Ochlerotatus trivittatus*	N/S	
59	Webster	CM09NS-1630	8/10/2009	2	Westwood St.	1	*Ochlerotatus canadensis*	N/S	
60	Webster	CM09-0389	8/24/2009	2	Westwood St.	15	*Culex species*	WNV & EEE	Negative
61	Webster	CM09-0411	8/24/2009	1	Highland St.	17	*Culex species*	WNV & EEE	Negative
62	Webster	CM09NS-2123	8/24/2009	2	Westwood St.	17	*Ochlerotatus japonicus*	N/S	
63	Webster	CM09NS-2124	8/24/2009	2	Westwood St.	13	*Ochlerotatus triseriatus*	N/S	
64	Webster	CM09NS-2125	8/24/2009	2	Westwood St.	1	*Culiseta melanura*	N/S	
65	Webster	CM09NS-2126	8/24/2009	2	Westwood St.	1	*Uranotaenia sapphirina*	N/S	
66	Webster	CM09NS-2219	8/24/2009	1	Highland St.	1	*Culiseta melanura*	N/S	
67	Webster	CM09NS-2220	8/24/2009	1	Highland St.	2	*Anopheles punctipennis*	N/S	
68	Webster	CM09NS-2221	8/24/2009	1	Highland St.	2	*Psorophora ferox*	N/S	
69	Webster	CM09NS-2222	8/24/2009	1	Highland St.	2	*Ochlerotatus hendersoni*	N/S	
70	Webster	CM09NS-2223	8/24/2009	1	Highland St.	2	*Ochlerotatus triseriatus*	N/S	
71	Webster	CM09NS-2224	8/24/2009	1	Highland St.	26	*Coquillettidia perturbans*	N/S	
72	Webster	CM09NS-2225	8/24/2009	1	Highland St.	2	*Ochlerotatus canadensis*	N/S	
73	Webster	CM09-0462	9/3/2009	2	Slater St.	40	*Culex species*	WNV & EEE	Negative
74	Webster	CM09NS-2487	9/3/2009	2	Slater St.	11	*Ochlerotatus japonicus*	N/S	

WEBSTER SURVEILLANCE DATA
2009

#	Town	Pool ID	Trap Set Date	Number of Traps	Trap Site	Pool Size	Species	Test Type	Result
75	Webster	CM09NS-2488	9/3/2009	2	Slater St.	20	*Ochlerotatus triseriatus*	N/S	
76	Webster	CM09NS-2489	9/3/2009	2	Slater St.	3	*Anopheles barberi*	N/S	
77	Webster	CM09NS-2490	9/3/2009	2	Slater St.	1	*Anopheles quadrimaculatus*	N/S	
78	Webster	CM09NS-2491	9/3/2009	2	Slater St.	1	*Anopheles punctipennis*	N/S	
79	Webster	CM09NS-2843	9/17/2009	2	Slater St.	2	*Culex species*	N/S	
80	Webster	CM09NS-2844	9/17/2009	2	Slater St.	2	*Ochlerotatus japonicus*	N/S	
81	Webster	CM09-0529	9/21/2009	2	Westwood St.	14	*Ochlerotatus japonicus*	WNV & EEE	Negative
82	Webster	CM09-0534	9/21/2009	1	Highland St.	20	*Culiseta melanura*	WNV & EEE	Negative
83	**Webster**	**CM09-0534**	**9/21/2009**	**1**	**Highland St.**	**20**	***Culiseta melanura***	**EEE**	**Positive**
84	Webster	CM09NS-2882	9/21/2009	2	Westwood St.	4	*Culex species*	N/S	
85	Webster	CM09NS-2883	9/21/2009	2	Westwood St.	1	*Culiseta melanura*	N/S	
86	Webster	CM09NS-2899	9/21/2009	1	Highland St.	2	*Aedes vexans*	N/S	
87	Webster	CM09NS-2900	9/21/2009	1	Highland St.	1	*Anopheles punctipennis*	N/S	
88	Webster	CM09-0587	10/1/2009	1	Highland St.	5	*Culiseta melanura*	WNV & EEE	Negative
89	Webster	CM09NS-3137	10/1/2009	1	Highland St.	1	*Culex species*	N/S	
90	Webster	CM09NS-3138	10/1/2009	1	Highland St.	1	*Ochlerotatus japonicus*	N/S	
91	Webster	CM09NS-3139	10/1/2009	1	Highland St.	1	*Ochlerotatus triseriatus*	N/S	
92	Webster	CM09NS-3140	10/1/2009	1	Highland St.	1	*Anopheles punctipennis*	N/S	
93	Webster	CM09-0595	10/2/2009	1	Highland St.	42	*Culiseta melanura*	WNV & EEE	Negative
94	**Webster**	**CM09-0595**	**10/2/2009**	**1**	**Highland St.**	**42**	***Culiseta melanura***	**EEE**	**Positive**
95	Webster	CM09NS-3246	10/2/2009	1	Highland St.	3	*Anopheles punctipennis*	N/S	
96	Webster	CM09NS-3247	10/2/2009	1	Highland St.	1	*Psorophora ferox*	N/S	
97	Webster	CM09NS-3248	10/2/2009	1	Highland St.	3	*Aedes vexans*	N/S	
98	Webster	CM09NS-3249	10/2/2009	1	Highland St.	3	*Aedes cinereus*	N/S	
99	Webster	CM09NS-3250	10/2/2009	1	Highland St.	2	*Ochlerotatus canadensis*	N/S	
100	Webster	CM09NS-3159	10/5/2009	2	Westwood St.	1	*Ochlerotatus japonicus*	N/S	
		100 collections				**1101**	**mosquitoes collected**		
		16 collections submitted for testing				**349**	**submitted for testing**		
		TWO ISLOLATIONS OF EEE IN 2009				**N/S=not submitted for testing**			

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 92) 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 out 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** 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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