COMMONWEALTH OF MASSACHUSETTS
STATE RECLAMATION & MOSQUITO CONTROL BOARD

***CENTRAL MASSACHUSETTS MOSQUITO CONTROL PROJECT***

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# EXECUTIVE SUMMARY
# 2018

*March 2019*

## CMMCP MISSION STATEMENT

The objective of the Central Massachusetts Mosquito Control Project (CMMCP) is to attain an efficient, economic mosquito control operation which will provide the best results possible and be consistent with all ecological aspects and the best interests of the member towns.

Our goal is to reduce mosquito exposure to the public, and the potential for disease transmission by mosquitoes, by utilizing proven, sound mosquito control techniques. CMMCP believes the best way to accomplish this task is by practicing an Integrated Pest Management (IPM) approach as it relates to mosquito control in Massachusetts. IPM utilizes a variety of control techniques and evaluation procedures. Control efforts are undertaken only after surveillance data has been collected and analyzed. Training, experience and common sense dictate our response in any given situation.

It is our desire and responsibility for this Project to have the best mosquito control for the communities that we serve.

## INTRODUCTION:

The Central Massachusetts Mosquito Control Project currently provides its services to 42 cities and towns throughout Middlesex and Worcester Counties. The Project's headquarters is located at 111 Otis Street, Northboro, MA. Please call (508) 393-3055 during business hours for information. Twenty-two (22) full time and eight (8) seasonal staff were employed at CMMCP in 2018. This the year we received a total of nineteen thousand, four hundred and ninety-two (19,492) requests for service from town residents and officials. A map of our service area is on page 7.

## EDUCATION:

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 residents to discuss mosquito biology, mosquito habitat, and control procedures. Much of the presentation is directed towards what can be done to prevent mosquitoes from breeding around their homes. This program is tailored to meet the needs of the specific audience. In 2017, CMMCP laboratory personnel and other administrative staff made sixty-four (64) educational presentations before two thousand five hundred fifty-eight (2,558) elementary school students in twenty-one (21) elementary schools. CMMCP admin staff were interviewed on several cable TV and local radio stations. 2011 marked the start of the “CMMCP Mosquito Education Program for Seniors” in which presentations are conducted at local senior centers to increase mosquito-borne disease awareness. Three (3) presentations to forty-five (45) senior citizens were conducted in 2018. Over 1,000 specialized brochures for this program were distributed through this program. Several different 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 in area Town/City Halls throughout the year. Bookmarks with educational information have been printed and stocked in member libraries and town halls, and are used as part of the education program. We also have a website at www.cmmcp.org that has extensive information on mosquito biology, our control procedures, products we use, etc.

**DITCH MAINTENANCE & WETLAND RESTORATION:**

As part of our effort to reduce the need for pesticides we continue to place great emphasis our wetlands restoration program. By cleaning clogged, degraded and overgrown waterways, mosquito breeding from that area can be reduced or eliminated and drainage areas are restored to historic conditions. Three thousand, five hundred and thirty-one (3,531) 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 two hundred and seven thousand, nine hundred (207,900) feet of streams, brooks and ditches. This represents over thirty-nine (39) miles of waterways which were cleaned and improved by Project personnel in 2018.

**ARBOVIRUS CONTROL:**

As part of our West Nile Virus (WNV) prevention program, a record one hundred and four thousand, two hundred and thirty-one (104,231) catch basins were treated with larvicidal products to control the mosquitoes that seek out these cool dark wet areas to develop, including the *Culex* species of mosquito, a major target for West Nile Virus transmission. We identify priority areas in each town and treat the basins in these selected areas to reduce the emergence of this arbovirus. The priority areas are as follows: prior year WNV activity; senior centers & over 55 housing developments; recreation areas; schools and neighborhoods (higher density first); industrial areas. We performed pre-emptive treatments in late May in areas that showed West Nile Virus in the prior year, with follow up treatments throughout in the season as part of our standard protocol treatment. Additional seasonal staff and the new electronic mapping and routing program for adulticiding were responsible for this large increase in basin treatments.

**MOSQUITO SURVEILLANCE:**

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. One thousand nine hundred and sixty-four (1,964) pools (collections) of mosquitoes totaling forty-eight thousand nine hundred (48,900) individual specimens were tested for mosquito-borne viruses this year. A record one hundred and fifty-nine (159) collections were identified positive this year; all with West Nile Virus (WNV). CMMCP lab personnel processed at total of five thousand, two hundred and sixty-four (5,264) collections of mosquitoes containing ninety six thousand and ninety-eight (96,098) individual

specimens, representing thirty (30) mosquito species.

| Target Species | *Ae. vexans* | *Cq. perturbans* | *Cs. melanura* | *Oc. canadensis* | *Culex spp.* | All Species |
|---|---|---|---|---|---|---|
| **No. Pools** | 240 | 566 | 185 | 195 | 1,497 | 5,264 |
| **Total Specimens** | 3,369 | 47,187 | 507 | 2,240 | 33,589 | 96,068 |
| **No. Pools WNV +** | 1 | 2 | 0 | 1 | 154 | 159 |
| **No. Pools EEE +** | 0 | 0 | 0 | 0 | 0 | 0 |

A table with the 2018 arbovirus information for our service area as well as the statewide results is included on page 8. Adult mosquito surveillance began in May and concluded in September. Four (4) full time seasonable employees were hired for the summer to assist our Staff Entomologist, Staff Biologist and Field Biologist in their duties.

**LARVAL MOSQUITO CONTROL:**

Bti (*Bacillus thuringiensis* var. *israelensis*) mosquito larvicide is a species specific, non-reproducing bacterium and is used to treat areas where mosquito larvae are found. Our field crews will investigate areas we have databased and treat the area if surveillance gathered at the time shows an imminent threat of mosquito emergence. Ten thousand two hundred (10,200) pounds of Bti (*Bacillus thuringiensis israelensis*) was applied by helicopter over two thousand and forty (2,040) acres in 3 towns, Chelmsford, Billerica & Boxborough, resulting in an 83.67% reduction in larval counts. Two thousand, three hundred and sixty-six (2,366) pounds were applied by ground crews over four hundred and seventy-three (473) acres throughout our service area to area wetlands to reduce the emergence of adult mosquitoes. This represents over two thousand, five hundred and thirteen (2,513) acres of wetland that was treated with this mosquito-specific bacterium, significantly reducing adult mosquito populations in these areas. We have several thousand areas catalogued that are checked and treated as needed on a routine basis, and many applications are small, measured in ounces. Larval control began in late March and continued throughout the month of September.

**ADULT MOSQUITO CONTROL:**

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 under 333CMR13 allows residents and/or town officials to exclude areas under their control from this or any part of our program. We apply the spray product at the lowest label rate unless mosquito-borne virus has been identified, and then we will consider other application rates depending on weather and other factors. Thirty-three (33) landing counts were performed by Project field staff as additional surveillance or prior to the application of etofenprox to confirm that pre-determined thresholds of mosquitoes

were exceeded to warrant an application. Landing rates are suspended when WNV or EEE is identified in Mass. Adult control began in early June and ended in mid-September with the onset of low nighttime temperatures, reduced service requests and low mosquito population density.

## RESEARCH AND EFFICACY

While CMMCP is an agency charged with the control of mosquitoes, we strive to check for efficacy of our products and techniques, and whenever possible perform research in new or different areas of mosquito control. Some of our 2016 Research projects were:

- Asian Tiger Mosquito (ATM) Surveillance in Central Mass.
- Field Trials of Natular™ G30 for Pre-Hatch Control of Mosquito Larvae in Selected Spring Brood Locations
- Field Trials of Natular™ G for Control of *Coquillettidia perturbans* Larvae in Selected Cattail Locations
- Aerial Mosquito Larval Control Program
- Bottle Assays of Field Collected Mosquitoes for Levels of Resistance to Zenivex® E4 in Central Mass

The addition of a fulltime Field Biologist in 2007 allowed these research projects to become more standardized, resulting in increased validity of the findings, reinforced by multiple seasons of trials. We have annual strategy sessions in the fall/winter seasons to plan for field trials and other anticipated research for the upcoming year. CMMCP departments as determined by the Executive Director will be expected to publish annually in such journals as the Journal of the AMCA (JAMCA), the NMCA or NJMCA Proceedings, Wing Beats, and other publications. The Field Biologist composes reports as directed, such as weekly surveillance, rainfall data, aerial larval control, etc. and will graph and track trends as directed. These reports will be disseminated to various parties, i.e. SRMCB, MDPH, CMMCP Commission, posted on the CMMCP website, etc.

## SOURCE REDUCTION/TIRE RECYCLING

For Earth Day 2010, CMMCP officially announced a tire recycling program added as a value added service to our member cities and towns. This program operates under grant monies received and the CMMCP operating budget. Tire piles provide suitable areas for larval mosquito development, including those species known to carry West Nile virus. During the course of one season, the potential exists for hundreds or even thousands of mosquitoes to emerge from just one tire. If tires infested with mosquito eggs, larvae or pupae are transported, the potential to introduce mosquito species into new areas and/or the potential for the spread of arboviruses and their transmission may increase significantly.

For these reasons and as a value added service to our member cites and towns, CMMCP has developed a used tire program, consisting of the following guidelines:

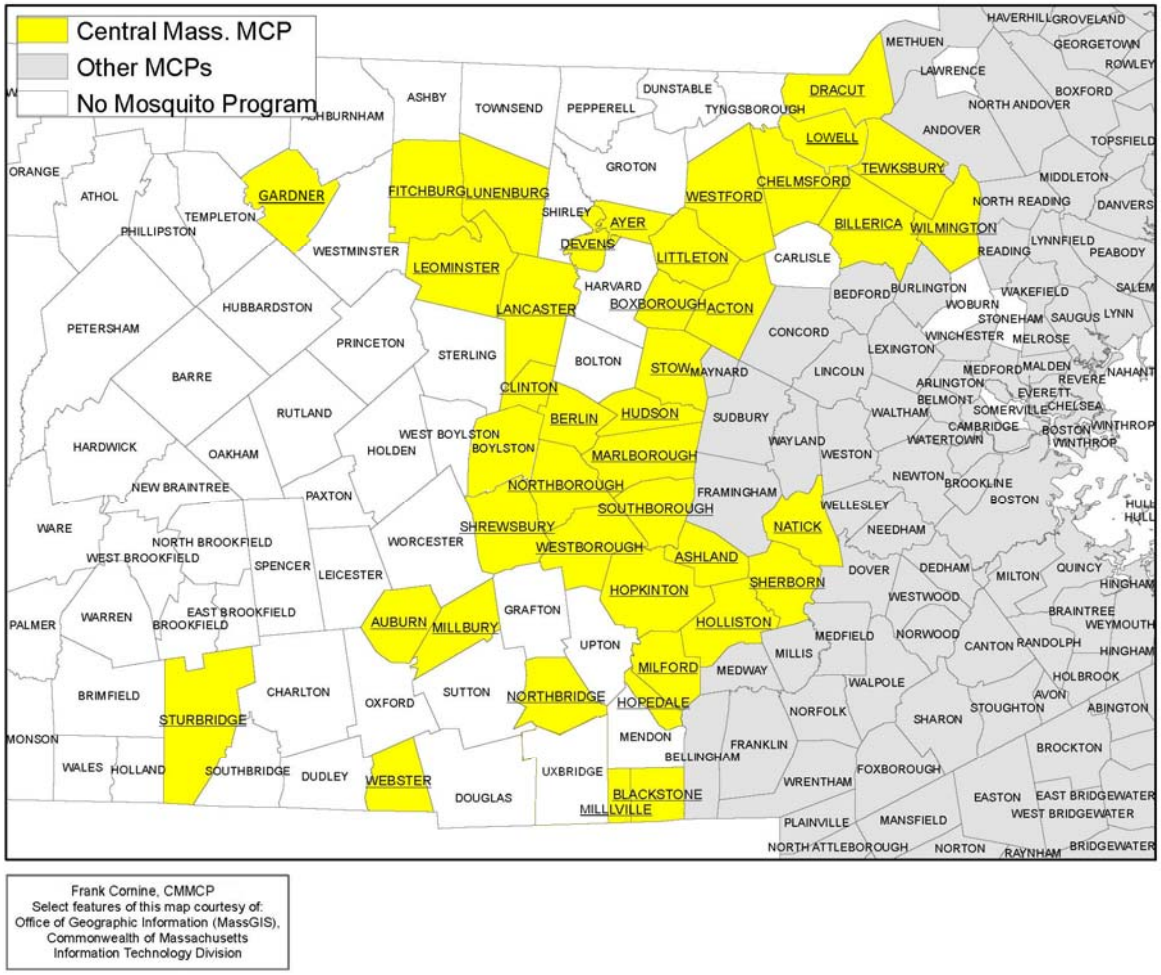
- We accept passenger and light truck tires only
- The maximum number tires from one property will be 10 at one time, subject to change without notice
- Requests for tire removal shall be done according to established procedures
- We reserve the right to refuse anything determined to be unsuitable for this program

Tires accepted as part of this program will be sent to an approved facility for recycling or disposal. This program is subject to end without notice. There is no additional cost to residents or municipalities; this program is part of the full suite of mosquito control services offered. In 2018 we collected a total of three thousand, four hundred and thirty-two (3,432) tires in thirty-seven (37) member cities and towns. Collections will continue as time and resources allow.

Some additional highlights from 2018:

- Resistance management study; no significant resistance to pyrethroids noted, no change recommended in adulticide material choice (see full report).
- Field trials of a naturally-occurring bacterium called spinosad shows promise for pre-hatch spring brood applications, as well as larval cattail mosquito (*Cq. perturbans*) control.
- Monitoring for the Asian Tiger Mosquito (*Ae. albopictus*) did not find specimens of this aggressive, invasive species in the Central Mass. area.
- CMMCP participates in the EPA's WasteWise program, tracking our source reduction (tire recycling) efforts. Our efforts in this program were recognized by the EPA – Region 1 in 2017 with a "Certificate of Achievement" for sustainable waste management practices.

## CMMCP SERVICE AREA – 2018




Member, Northeastern Mosquito Control Association

Member, New Jersey Mosquito Control Association

Partner, EPA Pesticide Environmental Stewardship Program

Partner, EPA WasteWise Program

Member, Massachusetts Municipal Association

Member, MassRecycle

## 2018 SUMMARY TOTALS

| Service Requests | Bti Lbs. | Bti Acres | Adulticide Gallons | Adulticide Acres |
|---|---|---|---|---|
| 19,492 | 12,566 | 2,513 | 974 | 190,882 |

| Pools Sent to MDPH | Landing Counts | Culverts Cleaned | Restoration Footage | Catch Basins Treated | Tires Recycled |
|---|---|---|---|---|---|
| 1,964 | 33 | 3,531 | 207,900 | 104,231 | 3,432 |

## ARBOVIRUS SUMMARY 2018

| **WNV Surveillance Summary – Statewide** | **2018** |
|---|---|
| Mosquito Pools Positive | 579 |
| Animals Positive | 2 |
| Humans Positive | 49 |
| **EEE Surveillance Summary – Statewide** | **2018** |
| Mosquito Pools Positive | 2 |
| Animals Positive | 2 |
| Humans Positive | 0 |
| **CMMCP Surveillance Summary** | **2018** |
| Mosquitoes Collected and Identified | 48,900 |
| Mosquito Pools Submitted for testing | 1,964 |
| Mosquito Pools Positive WNV | 159 |
| Animals Positive WNV | 0 |
| Humans Positive WNV | 0 |
| Mosquito Pools Positive EEE | 0 |
| Animals Positive EEE | 0 |
| Humans Positive EEE | 0 |

| Town | Total Service Requests | Bti Pounds | Bti Acres | Adulticide Gallons | Adulticide Acres | Catch Basins Treated | Mosquito Pools Tested | Mosquito Pools WNV Positive | Culverts Cleaned | Total Restoration Footage | Tires Recycled |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acton | 539 | 26.50 | 5.30 | 29 | 4,829 | 2,571 | 60 | 4 | 118 | 4,000 | 24 |
| Ashland | 469 | 64.75 | 12.95 | 24 | 3,855 | 2,817 | 42 | 4 | 91 | 8,940 | 71 |
| Auburn | 710 | 83.00 | 16.60 | 33 | 6,122 | 3,580 | 56 | 7 | 26 | 6,310 | 242 |
| Ayer | 191 | 20.00 | 4.00 | 10 | 2,028 | 1,448 | 55 | 7 | 111 | 2,689 | 1 |
| Berlin | 91 | 26.25 | 5.25 | 8 | 1,863 | 634 | 35 | 3 | 147 | 3,035 | |
| Billerica | 582 | 3,034.00 | 606.80 | 27 | 5,574 | 2,948 | 52 | 1 | 19 | 8,990 | 239 |
| Blackstone | 374 | 32.50 | 6.50 | 16 | 3,309 | 842 | 33 | 3 | 85 | 10,200 | |
| Boxborough | 85 | 4,228.00 | 845.60 | 13 | 3,513 | 985 | 45 | 3 | 58 | 3,150 | |
| Boylston | 287 | 34.00 | 6.80 | 7 | 1,485 | 1,263 | 39 | 2 | 131 | 2,590 | |
| Chelmsford | 1004 | 3,101.00 | 620.20 | 37 | 8,441 | 3,462 | 51 | 1 | 23 | 8,935 | 14 |
| Clinton | 201 | 43.00 | 8.60 | 17 | 3,367 | 1,502 | 33 | 7 | 47 | 3,240 | 232 |
| Devens | 6 | 24.00 | 4.80 | 7 | 1,610 | 772 | 49 | 4 | 102 | 2,702 | |
| Dracut | 923 | 35.00 | 7.00 | 36 | 7,808 | 2,728 | 47 | 3 | 27 | 2,550 | 10 |
| Fitchburg | 194 | 15.00 | 3.00 | 5 | 942 | 3,167 | 35 | 0 | 132 | 6,120 | 387 |
| Gardner | 75 | 26.25 | 5.25 | 4 | 661 | 3,235 | 33 | 1 | 146 | 3,365 | 401 |
| Holliston | 381 | 135.75 | 27.15 | 11 | 1,797 | 2,037 | 44 | 0 | 49 | 4,143 | 28 |
| Hopedale | 221 | 67.00 | 13.40 | 15 | 2,534 | 1,719 | 49 | 5 | 89 | 2,890 | 4 |
| Hopkinton | 672 | 112.25 | 22.45 | 29 | 2,766 | 2,530 | 43 | 0 | 51 | 6,560 | 28 |
| Hudson | 344 | 23.00 | 4.60 | 21 | 3,977 | 2,642 | 43 | 4 | 28 | 5,945 | 1 |
| Lancaster | 375 | 11.00 | 2.20 | 17 | 3,383 | 1,226 | 38 | 3 | 173 | 2,855 | 134 |
| Leominster | 212 | 26.00 | 5.20 | 15 | 3,060 | 3,675 | 39 | 3 | 164 | 3,865 | 527 |
| Littleton | 408 | 65.25 | 13.05 | 20 | 3,811 | 1,703 | 42 | 3 | 90 | 2,560 | 20 |
| Lowell | 169 | 35.00 | 7.00 | 5 | 1,052 | 5,259 | 53 | 1 | 28 | 3,225 | 4 |
| Lunenburg | 588 | 23.00 | 4.60 | 31 | 5,544 | 1,194 | 38 | 4 | 97 | 5,530 | 74 |
| Marlboro | 376 | 31.50 | 6.30 | 12 | 2,648 | 5,596 | 32 | 3 | 38 | 5,105 | 4 |
| Milford | 619 | 136.00 | 27.20 | 40 | 6,923 | 2,748 | 46 | 1 | 170 | 3,070 | |
| Millbury | 498 | 155.50 | 31.10 | 17 | 3,856 | 1,452 | 41 | 2 | 103 | 2,895 | 99 |
| Millville | 167 | 38.50 | 7.70 | 7 | 1,307 | 586 | 39 | 2 | 123 | 2,895 | 1 |
| Natick | 747 | 91.75 | 18.35 | 24 | 4,691 | 3,421 | 46 | 2 | 134 | 4,225 | |
| Northboro | 442 | 46.75 | 9.35 | 29 | 5,721 | 2,393 | 58 | 10 | 69 | 3,300 | 46 |
| Northbridge | 705 | 65.75 | 13.15 | 28 | 4,928 | 1,455 | 37 | 4 | 126 | 7,865 | 26 |
| Sherborn | 152 | 54.25 | 10.85 | 14 | 1,550 | 1,157 | 47 | 1 | 44 | 15,090 | 267 |
| Shrewsbury | 639 | 108.50 | 21.70 | 39 | 7,589 | 4,806 | 50 | 5 | 70 | 4,015 | 32 |
| Southboro | 249 | 30.50 | 6.10 | 15 | 3,354 | 1,344 | 40 | 11 | 39 | 12,730 | 2 |

| Town | Total Service Requests | | Bti Pounds | Bti Acres | | Adulticide Gallons | Adulticide Acres | | Catch Basins Treated | | Mosquito Pools Tested | Mosquito Pools WNV Positive | | Culverts Cleaned | Total Restoration Footage | Tires Recycled |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Stow** | 557 | | 60.25 | 12.05 | | 26 | 4,671 | | 1,360 | | 46 | 3 | | 132 | 4,620 | 28 |
| **Sturbridge** | 799 | | 96.75 | 19.35 | | 41 | 9,659 | | 1,388 | | 43 | 2 | | 71 | 4,980 | 20 |
| **Tewksbury** | 1087 | | 54.25 | 10.85 | | 41 | 8,313 | | 3,263 | | 66 | 2 | | 50 | 3,700 | 213 |
| **Webster** | 414 | | 82.25 | 16.45 | | 9 | 1,952 | | 1,635 | | 39 | 1 | | 114 | 2,935 | 36 |
| **Westboro** | 510 | | 123.00 | 24.60 | | 21 | 5,030 | | 785 | | 26 | 3 | | 55 | 6,066 | 5 |
| **Westford** | 897 | | 60.00 | 12.00 | | 52 | 11,221 | | 1,687 | | 45 | 0 | | 60 | 4,810 | 15 |
| **Wilmington** | 1212 | | 38.75 | 7.75 | | 62 | 12,190 | | 1,729 | | 59 | 3 | | 61 | 2,710 | 185 |
| **Worcester** | 321 | | 0.00 | 0.00 | | 60 | 11,948 | | 13,487 | | 150 | 31 | | 40 | 2,500 | 12 |
| | | | | | | | | | | | | | | | | |
| **Totals** | **19,492** | | **12,566** | **2,513** | | **974** | **190,882** | | **104,231** | | **1,964** | **159** | | **3,531** | **207,900** | **3,432** |