COMMONWEALTH OF MASSACHUSETTS
STATE RECLAMATION & MOSQUITO CONTROL BOARD

CENTRAL MASSACHUSETTS MOSQUITO CONTROL PROJECT

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EXECUTIVE SUMMARY
2022

January 2023

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 44 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-four (24) full time and eleven (11) seasonal staff were employed at CMMCP in 2022. This the year we received a total of eleven thousand, one hundred (11,100) 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. Due to the COVID-19 pandemic in 2020 and 2021, CMMCP laboratory personnel and other administrative staff were once again unable to meet in person for any educational sessions. 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. Over 1,200 specialized brochures for this program have been distributed to area seniors. 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 have a website at https://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. Six thousand, five hundred and thirty-nine (6,539) 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 thousand, four hundred and fifty-six (200,456) feet of streams, brooks and ditches. This represents nearly thirty-eight (38) miles of waterways which were cleaned and improved by Project personnel in 2022.

ARBOVIRUS CONTROL:

As part of our West Nile Virus (WNV) prevention program, one hundred and seven thousand, four hundred and ninety-seven (107,497) 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, two hundred and eleven (1,211) pools (collections) of mosquitoes totaling twenty-four thousand, eight hundred and eighty-six (24,886) individual specimens were tested for mosquito-borne viruses this year. Six (6) collections were identified positive this year for West Nile Virus, zero (0) pools of EEE were collected. CMMCP lab personnel processed at total of three thousand, two hundred and ninety-nine (3,299) collections of mosquitoes containing sixty-one thousand, seven hundred and fifty-five (61,755) individual specimens, representing thirty (30) mosquito species.

Target Species	*Ae. vex*	*Cq. per*	*Cs. mel*	*Oc. can*	*Culex*	All Species
No. Pools	102	667	130	115	583	3,111
Total Specimens	710	30,730	516	1,129	3,489	52,693
No. Pools WNV +	0	0	0	0	6	6
No. Pools EEE +	0	0	0	0	0	0

A table with the 2022 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. Five (5) full-time seasonable employees were hired for the summer to assist our Staff Entomologist and Staff Biologist in their duties.

LARVAL MOSQUITO CONTROL:

Our pre-hatch program went fully operational in 2022 after several years of successful field trials. An organically-certified formulation of spinosad names Natular® G30 was applied to snow, ice and frozen ground in areas of historical larval activity. Previous field trials show control well past 30 days and these applications have expanded our larval control program. Two hundred and fourteen (214) acres were treated across all member communities beginning in early March 2022. Post dipping data once again showed control beyond the 30-day application window.

Due to risk from EEE in 2019 and anticipated risk in 2020, 2021 and 2022 an enhanced larval control program was implemented using organically-certified formulations of bacterial products Natular™ G and Natular™ G30, active ingredient spinosad. 12-member communities that were identified as “Critical” risk from EEE in 2019 were targeted for this program. Wetlands in these communities that were considered larval habitat for *Cq. perturbans* were identified in our GIS program and field checked for possible applications by rotary aircraft. Sites <5 acres would be treated by ground crews. Due to the specialized biology of these 2 species, larval control is difficult and the spinosad products would be field trialed to gauge control efficacy. One thousand, five hundred and one (1,501) acres in all twelve (12) communities were treated with fifteen thousand and ten (15,010) pounds of Natular™ G in *Cq. perturbans* habitat.

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. Eight thousand, nine hundred and ninety (8,990) pounds of organically-certified Bti (*Bacillus thuringiensis israelensis*) was applied by helicopter over one thousand, seven hundred and ninety-eight (1,798) acres in 3 towns, Chelmsford, Billerica & Boxborough, resulting in an average 95.69% overall reduction in larval counts. Two hundred and sixty-four (264) additional acres were treated by hand in our area during the spring and summer months. We treated 23 acres of *Cq. perturbans* habitat using backpack equipment to control the 2023 initial generation of this species. In all, our larval control program totaled over three thousand, eight hundred and fifty (3,850) acres of wetland that was treated, 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 with Bti began in late March and continued throughout the month of September.

ADULT MOSQUITO CONTROL:

Our goal is to manage all mosquito problems with education, water management or larval control, but we recognize that there are times when adult mosquito spraying is the best viable solution. In such cases specific areas are treated with 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. One hundred and sixty-four (164) 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 anywhere in Mass. Adult control began in early June and ended in early 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 2022 Research projects were:

- 2022 Enhanced Larval Control Program for EEE Mitigation
- 2022 Aerial Larval Mosquito Control Program
- 2022 Level of Resistance to Zenivex E4
- 2022 Efficacy Trials of the CMMCP Adulticide Program
- Evaluation of Mosquito Larvicides in Catch Basin Systems
- *Aedes albopictus* Egg Collections - 2022

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.

Some additional highlights from 2022:

- 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 for pre-hatch spring brood applications ended and we have gone operational in this program, as well as larval cattail mosquito (*Cq. perturbans*) control in late summer.
- Monitoring for the Asian Tiger Mosquito (*Ae. albopictus*) did not find specimens of this aggressive, invasive species in the Central Mass. area, and our ATM control protocols did not need to be instituted.
- 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.

SOURCE REDUCTION/TIRE RECYCLING

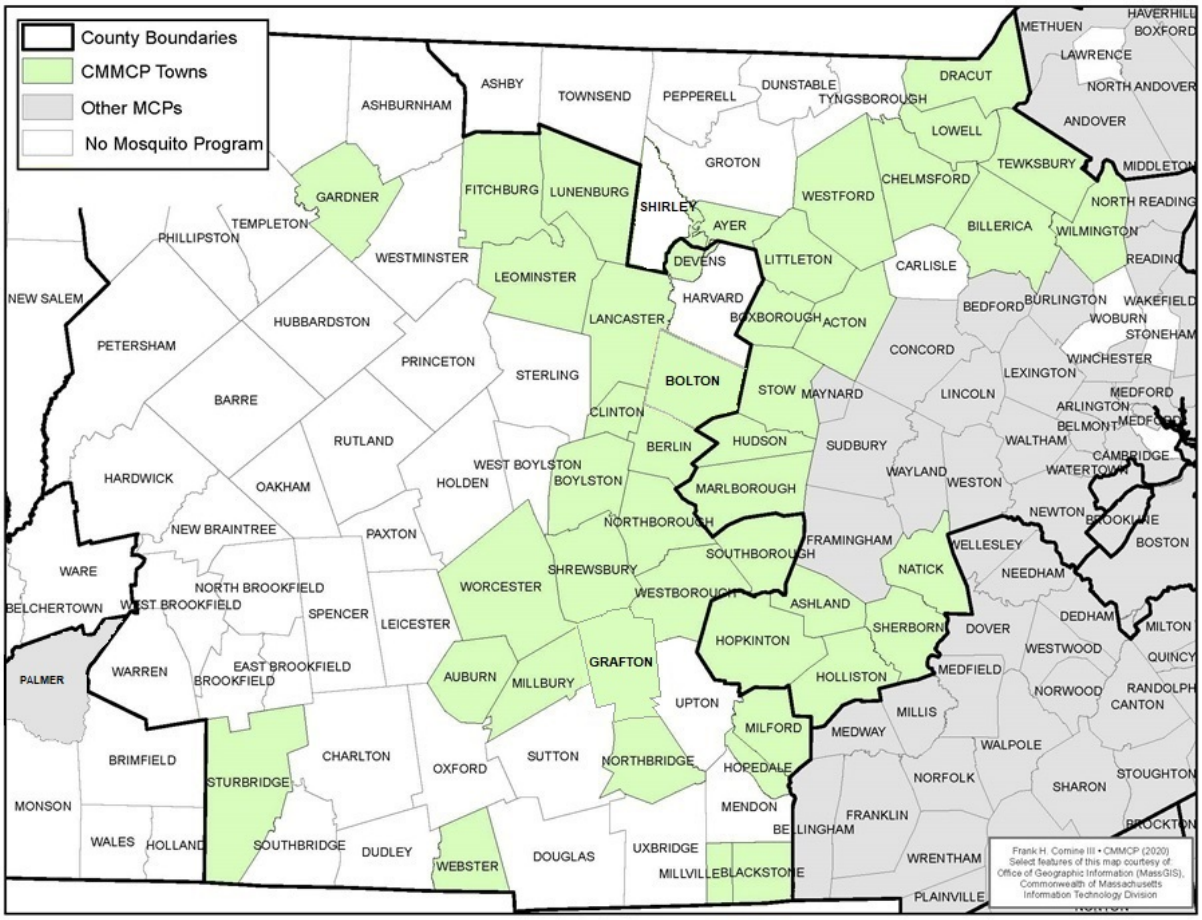
For Earth Day 2010, CMMCP officially announced a tire recycling program added as a value-added service to our member cities and towns. This program operates under grant monies received and the CMMCP operating budget. Tire piles provide suitable areas for larval mosquito development, including those species 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 2022 we collected a total of three thousand and thirty-three (3,033) tires in thirty-one (31) member cities and towns. Collections will continue as time and resources allow.

CMMCP SERVICE AREA – 2022



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

2022 SUMMARY TOTALS

Service Requests	Larval/Pupal Acres Treated	Adulticide Gallons	Adulticide Acres
11,100	3,850	421	69,964

Pools Sent to MDPH	Landing Counts	Culverts Cleaned	Restoration Footage	Catch Basins Treated	Tires Recycled
1,211	164	6,539	200,456	107,497	3,033

ARBOVIRUS SUMMARY 2022

WNV Surveillance Summary – Statewide	**2022**
Mosquito Pools Positive	95
Animals Positive	0
Humans Positive	6
EEE Surveillance Summary – Statewide	**2022**
Mosquito Pools Positive	0
Animals Positive	0
Humans Positive	0
CMMCP Surveillance Summary	**2022**
Mosquitoes Collected and Identified	61,755
Mosquito Pools Submitted for testing	1,211
Mosquito Pools Positive WNV	6
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	Larval/ Pupal Control Acres	Adulticide Gallons	Adulticide Acres	Catch Basins Treated	Mosquito Pools Collected	Mosquito Pools Tested	Mosquito Pools EEE Positive	Mosquito Pools WNV Positive	Culverts Cleaned	Ditch Maintenance Footage	Tires Recycled
Acton	277	9.35	12.09	1,428.07	2,309	72	29	0	0	144	4,295	5
Ashland	252	170.30	6.16	989.98	2,646	50	23	0	0	154	3,795	27
Auburn	272	11.45	9.27	1,084.36	1,778	64	24	0	0	213	3,630	194
Ayer	132	7.22	3.23	573.57	1,629	106	34	0	0	168	3,060	2
Berlin	40	13.43	1.41	225.93	1,224	57	22	0	0	152	3,365	0
Billerica	508	580.95	18.20	3,125.80	3,183	81	34	0	0	149	11,605	0
Blackstone	164	11.55	4.66	580.95	1,632	73	21	0	0	124	3,550	54
Bolton	57	12.72	1.92	259.79	1,861	74	26	0	0	130	4,836	0
Boxborough	43	789.30	1.95	315.21	1,805	50	25	0	0	139	4,960	0
Boylston	172	12.64	9.52	1,714.68	1,503	63	26	0	0	163	3,509	0
Chelmsford	477	466.97	16.40	2,791.64	2,751	74	31	0	0	157	3,955	2
Clinton	112	5.68	4.18	694.37	2,270	59	25	0	0	130	3,731	224
Devens	4	7.94	0.04	5.17	1,892	67	24	0	0	152	2,660	0
Dracut	357	9.88	21.19	3,758.79	2,195	83	27	0	0	183	3,325	3
Fitchburg	97	7.20	3.06	379.68	2,147	77	28	0	0	145	3,560	296
Gardner	130	8.85	3.07	536.02	1,758	87	40	0	0	163	3,540	233
Grafton	69	88.45	3.82	625.14	2,127	63	26	0	0	149	3,165	43
Holliston	223	219.42	8.93	1,438.55	2,110	45	19	0	0	153	6,901	0
Hopedale	109	44.88	4.21	539.12	2,054	69	27	0	0	130	3,955	40
Hopkinton	480	162.18	13.89	2,298.34	3,360	58	24	0	0	151	5,365	0
Hudson	248	13.65	7.90	1,381.32	2,807	62	30	0	0	129	3,143	14
Lancaster	227	14.00	8.82	1,458.71	1,482	70	26	0	0	137	4,086	53
Leominster	141	9.03	2.59	370.18	1,538	69	23	0	0	151	4,606	577
Littleton	174	9.48	4.77	774.48	2,066	92	31	0	0	162	3,600	46
Lowell	132	4.43	3.44	581.46	3,789	174	33	0	0	146	3,390	0
Lunenburg	253	9.56	10.10	1,644.94	1,826	70	26	0	0	120	3,235	15
Marlboro	144	97.58	5.53	1,045.87	3,909	81	30	0	0	135	10,578	4
Milford	353	144.18	16.26	2,764.44	3,822	76	30	0	0	131	3,435	3
Millbury	220	6.00	7.39	1,275.34	1,667	73	29	0	1	200	5,060	566
Millville	72	15.70	3.31	407.50	867	70	29	0	0	127	3,055	0
Natick	247	10.31	8.15	1,479.28	4,104	64	35	0	2	124	5,027	1
Northboro	197	272.48	6.55	1,148.87	2,258	52	24	0	0	160	3,510	32
Northbridge	342	58.15	10.39	1,177.78	1,717	58	25	0	0	134	3,770	0
Sherborn	76	50.11	2.96	450.42	1,023	47	28	0	0	124	9,267	0
Shrewsbury	486	68.55	9.47	1,890.46	3,807	35	23	0	0	187	8,390	153
Southboro	111	24.62	4.50	852.31	1,622	59	24	0	0	128	5,741	0
Stow	307	10.65	10.98	1,644.15	2,121	77	30	0	0	162	3,658	12
Sturbridge	513	14.40	24.69	4,424.33	1,819	87	29	0	0	120	5,095	237
Tewksbury	724	7.95	25.64	4,536.05	2,590	71	22	0	0	165	4,545	26

Town	Total Service Requests	Larval/ Pupal Control Acres	Adulticide Gallons	Adulticide Acres	Catch Basins Treated	Mosquito Pools Collected	Mosquito Pools Tested	Mosquito Pools EEE Positive	Mosquito Pools WNV Positive	Culverts Cleaned	Ditch Maintenance Footage	Tires Recycled
Webster	185	15.30	4.95	687.74	1,805	101	35	0	0	122	3,255	4
Westboro	193	317.65	12.31	2,222.05	3,099	54	26	0	0	159	6,653	34
Westford	836	20.37	49.47	8,378.61	2,132	68	27	0	0	198	3,855	31
Wilmington	809	9.33	26.78	4,730.57	3,376	71	25	0	0	131	3,580	98
Worcester	135	6.13	7.30	1,272.97	10,017	246	36	0	3	138	3,160	4
Totals	**11,100**	**3,850**	**421.45**	**69,964.99**	**107,497**	**3,299**	**1,211**	**0**	**6**	**6,539**	**200,456**	**3,033**