Commonwealth of Massachusetts

STATE RECLAMATION AND MOSQUITO CONTROL BOARD

NORTHEAST MASSACHUSETTS MOSQUITO CONTROL AND WETLANDS MANAGEMENT DISTRICT

118 Tenney Street
Merrimac, MA 01833
Phone: (978) 352-2800
www.nemassmosquito.org

2022 Best Management Practice Plan
Merrimac

FY23 Percentage of assessment allocated to specific measures as prescribed by individual municipalities Best Management Practice (BMP) in the Town of Merrimac

NEMMC is requesting a 3% increase above the FY2022 certified assessment for a FY2023 operational budget. During FY2022 the District reorganized allowing more technicians in the field while maintaining our current staffing level. FY2022 allowed the district the opportunity to replace one of our frontline heavy equipment pieces which was 23 years old. Due to ongoing pandemic challenges, the district was unable to make the vehicle purchases it had intended to keep on schedule with our vehicle and equipment replacement plan. Our FY2023 budget addresses funding for staffing changes, allowing for two vehicle replacements, and to adapt with increased costs of materials, energy, fuel, and pesticides. With the region experiencing environmental changes, it remains challenging to plan for a "normal" year of mosquito control. Often dictated by the weather, mosquito populations, additional treatment for viruses and requests from member municipalities, NEMMC will work diligently to deal with exceptional mosquito nuisance and health issues.

Assessment: As estimated by the Massachusetts Department of Revenue, Division of Local Services, in accordance with Chapter 516 of the General Laws of the Commonwealth. The assessment formula is based on a regional concept, which considers square miles and evaluation. The district offers this breakdown as a general guide to how funds are allocated specific to your community.

FY23 Estimated District Budget for the Town of Merrimac	$ 31,823.00
FY23 State Reclamation and Mosquito Control Board	$ 1,364.00
FY23 Total Estimated Assessment for the Town of Merrimac	$ 33,187.00

District Control Measures specific to Merrimac

General Operational Cost Share

Regional Adult Mosquito Surveillance Program

Regional Vector / Virus Intervention

Surveillance

Ground Larviciding

Catch Basin Treatments

Manual Ditch Maintenance

Adulticiding **(Resident and/or Board of Health requests)**

Barrier Treatment **(School officials and/or Board of Health requests)**

Ditch Maintenance / Wetlands Management

Tire Recycling Program

Property Inspections

Mosquito Habitat Mitigation

Research and Development

Education and Outreach

Social Media

NOTE: Any adulticiding, larviciding or treatment of catch basins for mosquito control on public school property requires a current IPM (Integrated Pest Management) Plan. We are often asked by local Boards of Health and/or athletic directors to treat ball fields and/or parks that may be owned/used by the school departments, and without an IPM plan that includes our materials we may not be able to assist.

Board of Health Checklist for 2022

☐ **Schedule an annual Board of Health meeting/ presentation with NEMMC**

Note: meetings will only be scheduled between the dates of October 1st - June 1st

☐ **Review login information for Municipal Toolbox on NEMMC website**

Our Liaison, Kelsey will e-mail you the password and login (see contact below)

☐ **Update School IPMs to have all current and recently added NEMMC pesticide products**

Recently added pesticide products include Metalarv XRP and Merus 3.0

☐ **Schedule Barrier Treatment for schools, parks, and/or public areas for peak mosquito season**

Note: scheduled barrier treatments are recommended between July 15th – August 25th

☐ **Check with Department of Public Works for field access for barrier treatments once scheduled**

☐ **Notify NEMMC with Board of Health contact changes**

Work phone, cell phone, and email are required of primary and secondary contacts

☐ **Review District Phased Response to WNV/EEE Virus Isolations in Integrated Pest and Vector Management Plan (IPVMP)**

For any questions on where to find this information, scheduling, and/or how to complete these tasks, please reach out to our Board of Health Liaison:

Kelsey Liakos, Board of Health Liaison
Cell: (978) 992- 6974
Office: (978) 352- 2800 Email: Kelsey.liakos@mass.gov

Updated 2022 NEMMC Protocols for District Arboviral Events

Climate change is expected to affect the geographic and seasonal patterns of mosquito-borne diseases in the United States. The northeast is experiencing an increase in precipitation and unusually hot temperatures. Since EEE is more prevalent in wetter years and WNV in hotter years the likeness of the district experiencing EEE and/or WNV events in any given year is possible, in some years both viruses can present substantial risk. The district feels that it is beneficial to our subscribing municipalities to set prevention and response criteria preparing for both mosquito-borne viruses.

District Prevention for WNV and EEE

- Adult mosquito surveillance and DPH virus testing
- Larviciding areas that can promote mosquito breeding including municipal catch basins
- Public notification to use personal protective measures from spring to first hard frost
- Wetlands management and stormwater maintenance
- Property inspections to larvicide standing water and remove containers holding water
- Early barrier treatments for public parks, recreation areas and schools
- Tire disposal program

District Response for WNV and EEE

If *risk level increases* for municipality but no virus in municipality:

- Public notification to use personal protective measures
- Additional larviciding of freshwater wetlands and flooded areas
- Recommendation for municipality to complete barrier treatments

If *bird biting mosquitoes* in municipality test positive for virus:

- Public notification to use personal protective measures
- Supplemental adult mosquito trapping and additional DPH virus testing in risk areas
- Additional larviciding of freshwater wetlands and flooded areas
- Retreatment of catch basins (if WNV) in focal area
- Retreatment of hummock swamps (if EEE) in focal area

If *human biting mosquitoes* in municipality test positive for virus:

- Public notification to use personal protective measures Supplemental adult mosquito trapping and additional DPH virus testing in risk areas
- Additional larviciding of freshwater wetlands and flooded areas
- Recommendation for municipality to complete a block adulticide of focal area
- Recommendation for municipality to complete barrier treatments

If *mammal or human case* of WNV or EEE in municipality:

- Public notification to use personal protective measures
- Supplemental adult mosquito trapping and additional DPH virus testing in risk areas
- Additional larviciding of freshwater wetlands and flooded areas
- Recommendation for municipality to complete a block adulticide of focal area
- Recommendation for municipality to complete barrier treatments

Summary of NEMMC District Operations Completed in Merrimac during 2021

Date	Activity Completed
1/11/2021	2021 Integrated Pest and Vector Management Plan published to NEMMC website
2/4/2021	2021 Draft Best Management Plans (BMP) e-mailed to BOH for review
4/7/2021	Habitat Site Inspections (15)
4/12/2021	Hand Ditch Maintenance- Little Pond Road 450 ft + 3 culverts cleaned
4/12/2021	Habitat Site Inspections (1)
4/13/2021	Contacted DPW for catch basin cleaning schedule and treatment notification
4/17/2021	Larviciding- Bear Hill Road, West Shore Road, Winter Street (4.87 lbs. Vectobac-G)
4/20/2021	Residential Pesticide Exclusion Received (1)
4/27/2021	Habitat Site Inspections (1)
5/3/2021	Larviciding- Winter Street, Winter Street Soccer Fields (17.89 lbs. Vectobac-G)
5/3/2021	Habitat Site Inspections (7)
6/1/2021	Residential Pesticide Exclusion Received (1)
6/3/2021	Residential Adulticiding Requests completed (1)
6/9/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
6/10/2021	Residential Adulticiding Requests completed (1)
6/16/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
6/22/2021	(2) Mosquito batch sent to DPH for EEE/WNV testing- Negative
6/22/2021	Residential Pesticide Exclusion Received (1)
6/30/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
7/20/2021	(3) Mosquito batch sent to DPH for EEE/WNV testing- Negative
7/28/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/3/2021	(3) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/10/2021	(2) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/17/2021	(2) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/24/2021	(2) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/26/2021	Catch basin larviciding (743 VectoMax WSP) + Sweetsir ES, Donaghue School (24 VectoMax WSP)
8/27/2021	Catch basin larviciding (112 VectoMax WSP)
8/27/2021	Municipal CB completed in Merrimac- 855 total basins treated and 24 total school basins= 879
8/31/2021	(3) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/8/2021	(2) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/14/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/21/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/28/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
10/1/2021	Adult mosquito surveillance and DPH testing concluded for season

- **2 Residential adulticide (ULV) service request, up from 1 in 2020**
- **0 Residential property inspection service requests & 0 BOH Larvicide service requests in 2021**

Informing residents that they can contact the district to inspect for standing water and help identify new breeding areas can help reduce mosquito populations.

- **24 Mosquito habitat site inspections**
- **Catch basin larviciding was completed on 8/27/2021: 879 total basins were treated (855 municipal, 24 school)**
- **3 Residential pesticide exclusions were filed with the district this year from Merrimac**
- **450 feet of stormwater ditches and 3 culverts were cleared of debris**

2021 Merrimac Mosquito & Arbovirus Surveillance Summary

There were no WNV/EEE mosquito isolations, human or animal cases in Merrimac in 2021. By the end of 2021, the arboviral risk level for Merrimac remained LOW for EEE and LOW for WNV. Risk Categories are described on pages 13, 22, 25 of the 2021 Massachusetts State Arbovirus Surveillance and Response Plan.

Massachusetts DPH assesses arboviral risk levels based on many factors including but not limited to mosquito isolations, locations of acquired veterinary and human infections, virus history locally and in bordering states, weather conditions present and predictions, and current mosquito populations and future trends.

- 26 mosquito pools/batches were sent from Merrimac to the MDPH lab for testing in 2021, all batches tested negative for EEE/WNV.

Total Mosquito Collected in Merrimac	**2020**	**2021**	**% Change**
Resting Boxes (16)- Bird feeders/EEE primary vectors	18	284	1478%
CDC CO2/Light Traps (1) - Mammal feeders/bridge vectors	256	133	-48%
Gravid Traps (1)- Bird feeders/WNV primary vectors	50	80	60%
Totals	**324**	**497**	**53%**

Mosquito Species- pest/disease list- Merrimac	**2020**	**2021**	**% Change**	**WNV/EEE +**	**District Total % Change 2020 to 2021**
Culiseta melanura (red maple swamp/acid bog)	9	62	589%	NO	11%
Culex pipiens (container/catch basins/heavy organics)	2	14	600%	NO	64%
Culex restuans (container/catch basins)	0	6	600%	NO	75%
Culex salinarius (brackish water/phragmites/roadside ditches)	11	1	-91%	NO	747%
Coquillitidia perturbans (cattail)	216	37	-83%	NO	-20%
Aedes vexans (rainwater/fresh floodwater)	5	9	80%	NO	1781%
Aedes japonicus (tree hole/container breeder)	6	14	133%	NO	52%
Aedes sollicitans (salt marsh)	1	0	-100%	NO	824%
Aedes cantator (salt marsh)	0	1	100%	NO	266%
Aedes canadensis (snowmelt/woodland pool)	0	4	400%	NO	588%

Mosquito virus isolation history (WNV/EEE) in Merrimac:

Collection Date	Species	Test Type	Result
8/21/2013	*Culiseta melanura*	WNV	Positive
8/21/2013	*Culiseta morsitans*	WNV	Positive
8/14/2013	*Culiseta melanura*	EEE	Positive
7/29/2013	*Culex pipiens/restuans* complex	WNV	Positive
9/23/2012	*Culex pipiens/restuans* complex	WNV	Positive
9/14/2011	*Culiseta melanura*	WNV	Positive
9/16/2009	*Culiseta melanura*	EEE	Positive
8/26/2009	*Culiseta melanura*	EEE	Positive
8/26/2009	*Aedes vexans*	EEE	Positive
8/19/2009	*Culiseta melanura*	EEE	Positive
9/03/2008	*Culiseta melanura*	WNV	Positive
7/30/2008	*Culiseta melanura*	WNV	Positive
9/25/2006	*Culiseta melanura*	EEE	Positive
9/13/2006	*Culiseta melanura*	EEE	Positive
9/06/2006	*Culiseta melanura*	EEE	Positive
8/23/2006	*Culiseta melanura*	EEE	Positive

WNV/EEE bridge vectors/mammal and bird biters

- Excessive and prolonged rain events during 2021 caused these species to increase district wide. However, there was a decrease of 13% in multiple fresh floodwater species in Merrimac; *Ae. vexans*, *Ae. canadensis* and *Cx. salinarius*, a brackish water mosquito. The cattail species *Cq. perturbans* have still not recovered from the drought conditions of 2020 and populations continued to decrease in Merrimac by 83% in 2021. Informing residents that they can contact the district to inspect for standing water and help identify new breeding areas can also reduce these populations.

WNV primary vectors/bird biters (*Cx. pipiens/restuans*)

- There was a 900% increase in collections of WNV primary vectors from 2020 to 2021 in Merrimac. Timely catch basin cleaning and treatments helped keep *Culex* mosquito populations in check. Informing residents that they can contact the district to inspect for standing water and help identify new breeding areas can also reduce these populations.

EEE primary vectors/bird biters (*Cs. melanura*)

- While 2019 was an unprecedented year for EEE statewide, due to early and sustained drought conditions and anticipatory targeted larviciding activities in the Northeast during 2020 the district saw an 81% decrease in Cs. melanura populations from 2019. In 2021 the average precipitation increased, and the district saw a slight 11% increase from 2020. However, there remains a decrease of 48% from the 10-year mean and 50% from the 5-year. It will take several years for these populations to recover from the droughts. Merrimac did show an increase of 589%. Only 1 batch of *Cs. melanura* tested positive for WNV in Boxford during 2021. There were no EEE isolates in this species during 2021.

Pest Status salt marsh mosquitoes/mammal biters (*Ae. sollicitans*)

- *Ae. sollicitans,* a summer-fall salt marsh species*,* decreased by 824% district-wide. However, despite consistent larviciding and adulticiding, tides, high temperatures, prevailing wind direction, frequent rain and heavy thunderstorm activity caused this mosquito species to become a serious weekly nuisance for the district and its residents throughout 2021.

Merrimac and nearby communities possess large stretches of forested wetlands which provide appropriate breeding sites for the EEE vector *Cs. melanura* and could serve as a local focus of EEE. There will always be concern of transmission and human infection by this virus in Merrimac and all surrounding municipalities. From July until the first hard frost, Merrimac residents should take necessary precautions to reduce the risk of infection from these viruses, regardless of low mosquito populations and/or aggressiveness of control.

A hard, or killing frost, is defined meteorologically as two consecutive hours of temperatures below 28 degrees Fahrenheit or three hours below 32 degrees. This will occur at different times for different communities, and there may even be variation within communities based on local geography. Although mosquitoes are not killed until a hard frost occurs, they are extremely unlikely to be active when temperatures fall below 50 degrees in the evening (Page 15 of the 2021 MA Arbovirus Plan listed below).

Refer to the 2021 Massachusetts State Arbovirus Surveillance and Response Plan viewed online at:
https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data