



**Commonwealth of Massachusetts**  
STATE RECLAMATION AND MOSQUITO CONTROL BOARD

**NORTHEAST MASSACHUSETTS MOSQUITO CONTROL  
AND WETLANDS MANAGEMENT DISTRICT**

118 Tenney Street  
Georgetown, MA 01833  
Phone: (978) 352-2800  
[www.nemassmosquito.org](http://www.nemassmosquito.org)



**Operations**

Barry Noone: *District Director*  
Kimberly A. Foss.: *Entomologist*  
Robyn A. Januszewski: *GIS/Biologist*  
Steven Przyjemski: *Wetlands Project Coordinator*

**Commissioners**

John W. Morris, CHO: *Chair*  
Vincent J. Russo, MD, MPH: *Vice Chair*  
Paul Sevigny, RS, CHO  
Joseph T. Giarrusso, Conservation Officer  
Rosemary Deci, RS

**2023 Best Management Practice Plan  
Middleton**

**FY24 Percentage of assessment allocated to specific measures as prescribed by individual municipalities  
Best Management Practice (BMP) in the Town of Middleton**

NEMMC is requesting a 3% increase above the FY2023 certified assessment for a FY2024 operational budget. During FY2023 the District reorganized allowing more technicians in the field and the district is anticipated to be at full staff this year. FY2023 allowed the opportunity to replace one of our frontline heavy equipment pieces. Due to ongoing supply shortages, the district was unable to make intended vehicle replacement purchases. Our FY2024 budget addresses funding for an increase of approximately \$84,000 for regional aerial larviciding treatments. This also includes the increased costs of materials, energy, fuel, pesticides, full staffing and two vehicle replacements. The State mandated EV First Initiative comes with a substantial cost increase when replacing vehicles. Regional environmental changes remain 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.

FY24 Estimated District Budget for the Town of Middleton	\$ 56,477.00
FY24 State Reclamation and Mosquito Control Board	\$ 2,406.00
FY24 Total Estimated Assessment for the Town of Middleton	\$ 58,883.00

**District Control Measures specific to Middleton**

General Operational Cost Share

Regional Adult Mosquito Surveillance Program

Regional Vector / Virus Intervention

Surveillance

Ground Larviciding

Catch Basin Treatments

Manual Ditch Maintenance

Adulticiding (**Board of Health approval only**)

Barrier Treatment (**By Board of Health and School Department request only**)

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 2023

☐ **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 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:

Barry Noone, Director/Board of Health Liaison

Cell: (978) 609-1859

Office: (978) 352- 2800 Email: [barry.noone@mass.gov](mailto:barry.noone@mass.gov)

## 2023 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 Middleton during 2022

Date	Activity Completed
6/15/2021	Barrier Adulticide Treatment- Middleton Transfer Station (7.5 oz Suspend Polyzone)
3/3/2022	2022 Draft Best Management Plans (BMP) e-mailed to BOH for review
3/8/2022	2022 Integrated Pest and Vector Management Plan published to NEMMC website
3/31/2022	District-wide Zoom NEMMC BOH/DPW Mosquito Control Overview Presentation & Spring Welcome
4/11/2022	Residential Pesticide Exclusions Received (5)
4/14/2022	Habitat Site Inspections (9)
4/27/2022	Larviciding- Ross Lane, Vera Road (1.98 lbs. VectoBac-G)
4/27/2022	Habitat Site Inspections (10)
4/27/2022	Resident Request Site Inspection- Wennerburg Road
6/14/2022	Pools Submitted to DPH for WNV/EEE Testing- 2 NEGATIVE
7/25/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
8/2/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
8/8/2022	Catch basin larviciding (1,196 VectoMax WSP) + How-Manning, Fuller Meadow School (10 VectoMax WSP)
8/8/2022	Catch Basins Middleton Completed = Total 1,206 (1,196 + 10 Schools)
8/8/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
8/16/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
8/23/2022	BOH barrier/ULV request completed- Rubchinok Park, Howe-Manning ES, Fuller Meadow ES (9.0 oz Suspend Polyzone)
8/23/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
8/31/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
10/1/2022	Adult mosquito surveillance and DPH testing concluded for the season

- **1 Residential property inspection service requests (down from 3 in 20201 & 0 BOH Larvicide service requests**  
Informing residents that they can contact the district to inspect for standing water and help identify new breeding areas can help reduce mosquito populations.
- **2 Board of Health adulticide service request (includes ULV & barrier treatments)**
- **19 Mosquito habitat site inspections**
- **Catch basin larviciding was completed on 8/8/2022: 1,206 total basins were treated (1,196 municipal, 10 school)**
- **5 Residential pesticide exclusions were filed with the district this year from Middleton**

## 2022 Middleton Mosquito & Arbovirus Surveillance Summary

There were no WNV/EEE mosquito isolations, human, or animal cases in Middleton in 2022. At the end of 2021, the arboviral risk level for Middleton remained at LOW for EEE and LOW for WNV. Risk Categories are described on pages 13, 22, 25 of the 2022 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.

## 2023 Best Management Practice Plan: Middleton

State arbovirus risk updates: <https://www.mass.gov/info-details/massachusetts-arbovirus-update#risk-maps->

- 8 mosquito pools/batches were sent from Middleton to the MDPH lab for testing in 2022, all batches tested negative for EEE/WNV.

### Mosquito virus isolation history (WNV/EEE) in Middleton:

Collection Date	Species	Test Type	Result
8/07/2013	<i>Culiseta melanura</i>	WNV	Positive
8/21/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/19/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/27/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/10/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive

Total Mosquito Collected in Middleton	2021	2022	% Change
Resting Boxes (8)- EEE primary vectors	52	15	-73%
CDC CO2/Light Traps (1) - Mammal feeders/bridge vectors	276	43	-84%
Gravid Traps (1)- WNV primary vectors	108	54	-50%
<b>Totals</b>	<b>436</b>	<b>112</b>	<b>-89%</b>

Mosquito Species- pest/disease list- Middleton	2021	2022	% Change	WNV/EEE +	District Total % Change 2021 to 2022
<i>Culiseta melanura</i> (red maple swamp/acid bog)	6	3	-50%	NO	-30%
<i>Culex pipiens</i> (container/catch basins/heavy organics)	58	32	-45%	NO	14%
<i>Culex restuans</i> (container/catch basins)	15	6	-60%	NO	-68%
<i>Culex salinarius</i> (brackish water/phragmites/roadside ditches)	113	1	-99%	NO	-99%
<i>Coquillitidia perturbans</i> (cattail)	16	37	131%	NO	41%
<i>Aedes vexans</i> (rainwater/fresh floodwater)	115	5	-96%	NO	-98%
<i>Aedes japonicus</i> (tree hole/container breeder)	23	13	-43%	NO	-19%
<i>Aedes sollicitans</i> (salt marsh)	0	0	-	NO	-68%
<i>Aedes cantator</i> (salt marsh)	0	1	-	NO	-35%
<i>Aedes canadensis</i> (snowmelt/woodland pool)	1	0	-100%	NO	-38%

### **WNV/EEE bridge vectors/human biters**

- Due to the prolonged drought event during 2022, there was a decrease in the fresh floodwater species *Ae. vexans* of 96% and *Cx. salinarius* of 99% in Middleton. The cattail species *Cq. perturbans* had a slight recovery due to an increase in late summer precipitation during 2021 and showed a population increase of 131% in 2022. 1 batch of *Cq. perturbans* did test positive in Rowley for WNV in 2022. There were no EEE isolates in these species during 2022. 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 48% decrease in collections of WNV primary vectors from 2021 to 2022 in Middleton. There is typically an increase in these vector species during hot dry years, but timely catch basin cleaning and treatments helped keep *Culex* mosquito populations in check. Only 2 batches of *Cx. pipiens* tested positive in Lynnfield and Haverhill for WNV in 2022. There were no EEE isolates in these species during 2022. 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 from 2020 through 2022. In 2022, the district saw a 30% decrease in *Cs. melanura* populations from 2021. It will take several years for *Cs. melanura* populations to recover from the droughts. There were no EEE isolates in these species during 2022.

**Pest Status** salt marsh mosquitoes (*Ae. sollicitans*)

- *Ae. sollicitans*, a summer-fall salt marsh species, also suffered from drought conditions. With less precipitation falling on the marshes the hatches were restricted to the usual tidal flow triggers. Total salt marsh mosquito populations in the district decreased by 49% from 2021.

With the extensive forested wetlands in Middleton and surrounding communities, there may be a local focus here of EEE virus. There is also history of WNV in Middleton and WNV arboviral risk levels increasing just south. There will always be concern for transmission and human infection by WNV/EEE in Middleton and all surrounding municipalities. From July through the first hard frost, 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 2022 MA Arbovirus Plan listed below).

Refer to the 2022 Massachusetts State Arbovirus Surveillance and Response Plan viewed online at:

<https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data>