



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



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 Decie, RS

**2023 Best Management Practice Plan
Salem**

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

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 City of Salem	\$ 54,486.00
FY24 State Reclamation and Mosquito Control Board	\$ 2,322.00
FY24 Total Estimated Assessment for the City of Salem	\$ 56,808.00

District Control Measures specific to Salem

General Operational Cost Share

Regional Adult Mosquito Surveillance Program

Regional Vector / Virus Intervention

Surveillance

Ground Larviciding

Catch Basin Treatments

Manual Ditch Maintenance

Adulticiding (**Virus Intervention ONLY with Board of Health approval**)

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

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 Salem during 2022

Date	Activity Completed
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
3/18/2022	Residential Pesticide Exclusion Received (1)
3/31/2022	District-wide Zoom NEMMC BOH/DPW Mosquito Control Overview Presentation & Spring Welcome
4/20/2022	Resident Request Site Inspection- Broad Street
4/20/2022	Habitat Site Inspections (1)
4/27/2022	Larviciding-East Collins Street salt marsh (6.44 lbs. Fourstar CRG)
4/27/2022	Habitat Site Inspections (1)
5/3/2022	Residential Pesticide Exclusion Received (1)
5/4/2022	Residential Pesticide Exclusion Received (1)
5/10/2022	Residential Pesticide Exclusions Received (9)
5/13/2022	Residential Pesticide Exclusion Received (1)
5/16/2022	Residential Pesticide Exclusion Received (1)
5/31/2022	Residential Pesticide Exclusion Received (1)
6/14/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
7/6/2022	Catch basin larviciding- (1,684 VectoMax WSP) + Bates ES, Carlton, Bentley Academy, Collins MS (23 Fourstar 90-day)
7/6/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
7/7/2022	Catch basin larviciding- (829 VectoMax WSP)
7/7/2022	Catch Basins Salem Completed = Total 2,536 (2,513 + 23 Schools)
7/19/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 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
8/20/2022	NEMMC attendance for Salem Tire Collection Day (26 tires collected)
8/23/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
9/7/2022	Pools Submitted to DPH for WNV/EEE Testing- 1 NEGATIVE
9/28/2022	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 inspections (down from 2 in 2021) and 0 BOH service request (down from 2 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.
- **2 mosquito habitat site inspections**
- **Catch basin larviciding was completed on 7/07/2022: 2,536 total basins were treated (2,513 municipal + 23 school)**
- **15 Residential pesticide exclusions were filed with the district this year from Salem**
- **26 abandoned tires were collected and disposed**

2022 Salem Mosquito & Arbovirus Surveillance Summary

There were no WNV/EEE mosquito isolations, human, or animal cases in Salem in 2022. By the end of 2022, the arboviral risk level for Salem remained REMOTE 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.

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

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

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

Collection Date	Species	Test Type	Result
9/5/2018	<i>Culex pipiens</i>	WNV	Positive
8/31/2016	<i>Culex pipiens</i>	WNV	Positive
9/14/2016	<i>Culex pipiens</i>	WNV	Positive
8/14/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/10/2013	<i>Culex pipiens</i>	WNV	Positive
9/05/2011	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/12/2011	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/12/2011	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/01/2007	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/08/2007	<i>Culex pipiens/restuans</i> complex	WNV	Positive

					<u>District Total % Change 2021 to 2022</u>
<u>Mosquito Species- pest/disease list- Salem</u>	<u>2021</u>	<u>2022</u>	<u>% Change</u>	<u>WNV/EEE +</u>	
<i>Culiseta melanura</i> (red maple swamp/acid bog)	0	0	-	NO	-30%
<i>Culex pipiens</i> (container/catch basins/heavy organics)	101	75	-26%	NO	14%
<i>Culex restuans</i> (container/catch basins)	14	3	-79%	NO	-68%
<i>Culex salinarius</i> (brackish water/phragmites/roadside ditches)	26	2	-92%	NO	-99%
<i>Coquillitidia perturbans</i> (cattail)	21	49	133%	NO	41%
<i>Aedes vexans</i> (rainwater/fresh floodwater)	47	18	-62%	NO	-98%
<i>Aedes japonicus</i> (tree hole/container breeder)	80	55	-31%	NO	-19%
<i>Aedes sollicitans</i> (salt marsh)	0	0	-	NO	-68%
<i>Aedes cantator</i> (salt marsh)	2	1	-50%	NO	-35%
<i>Aedes canadensis</i> (snowmelt/woodland pool)	0	1	-	NO	-38%

Total Mosquitoes Collected in Salem	2021	2022	% Change
CDC CO2/Light Traps (1) - Mammal feeders/bridge vectors	124	80	-35%
Gravid Traps (1)- WNV primary vectors	196	137	-30%
Totals	320	217	-32%

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 62% in Salem. *Cx. salinarius*, a brackish water mosquito which also relies on seasonal precipitation, decreased by 92%. 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 133% in 2022. Only 1 batch of *Cq. perturbans* tested 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 32% decrease in collections of WNV primary vectors from 2021 to 2022 in Salem. There is typically an increase in these vector species during hot dry years and 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.

Salem has a largely urban setting that favors the development of the WNV vectors. Due to extensive WNV history in Salem and surrounding communities, from mid-July to the first full hard frost, residents should take necessary precautions to reduce the risk of infection from WNV and other mosquito borne 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).

2023 Best Management Practice Plan: Salem

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>