



**Commonwealth of Massachusetts**  
STATE RECLAMATION AND MOSQUITO CONTROL BOARD  
  
**NORTHEAST MASSACHUSETTS MOSQUITO CONTROL  
AND WETLANDS MANAGEMENT DISTRICT**  
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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*  
Katelynn E. King: *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

**2022 Best Management Practice Plan  
Newbury**

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

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 Newbury	\$ 86,615.00
FY23 State Reclamation and Mosquito Control Board	\$ 3,712.00
FY23 Total Estimated Assessment for the Town of Newbury	\$ 90,327.00

**District Control Measures specific to Newbury**

General Operational Cost Share

Regional Adult Mosquito Surveillance Program

Regional Aerial Salt Marsh Larviciding 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 Newbury 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
3/26/2021	Tires collected (14)
4/1/2021	Residential Pesticide Exclusion Received (1)
4/13/2021	Contacted DPW for catch basin cleaning schedule and treatment notification
4/14/2021	Tires collected- Plum Island Turnpike (9)
4/15/2021	Larviciding- Main Street (3.0 lbs. Vectobac-G)
4/15/2021	Habitat Site Inspections (1)
4/22/2021	Hand Ditch Maintenance- Orchard Street 350 ft cleaned
4/23/2021	Hand Ditch Maintenance- Elm Street 1,500 ft cleaned
4/28/2021	Larviciding- Orchard Street, Middle Road (4.12 lbs. Vectobac-G)
4/28/2021	Tire collected - Middle Road (1)
4/28/2021	Habitat Site Inspections (10)
5/6/2021	Habitat Site Inspections (4)
5/12/2021	Residential Pesticide Exclusion Received (1)
5/21/2021	Habitat Site Inspections (7)
5/25/2021	Habitat Site Inspection (1)
6/3/2021	Residential Adulticiding Requests completed (7)
6/10/2021	Residential Adulticiding Requests completed (15)
6/17/2021	Residential Adulticiding Requests completed (18)
6/22/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
6/22/2021	Salt marsh dip station check- pre aerial application
6/23-6/24/2021	Aerial operation larvicide salt marsh- 850 acres
6/24/2021	Residential Adulticiding Requests completed (16)
6/24/2021	Larviciding- Pine Island Road, Plum Bush Downs (15.27 lbs. Vectobac-G)
6/25/2021	Salt marsh dip station check- post aerial application
6/28/2021	Larviciding- Scotland Bridge Road DOT yard tire pile (1.46 lbs. Fourstar CRG)
7/1/2021	Residential Adulticiding Requests (17) <b>Cancelled inclement weather</b>
7/6/2021	Larviciding- Hay Street Dip Station (2.86 lbs. VectoBac G)
7/7/2021	Catch basin larviciding (71 VectoMax WSP)
7/7/2021	Resident Request Site Inspection - Hay Street
7/8/2021	Residential Adulticiding Requests (18) <b>Cancelled inclement weather</b>
7/13/2021	Catch basin larviciding (82 VectoMax WSP) + Newbury ES and Harmony Natural LC (5 VectoMax WSP)
7/14/2021	Residential Adulticiding Requests (16)
7/14/2021	Catch basin larviciding (302 VectoMax WSP) + Governor Dummer, Triton HS (88 VectoMax WSP)
7/14/2021	Municipal CB completed in Newbury- 455 total basins treated and 93 total school basins treated = 548

*2022 Best Management Practice Plan: Newbury*

7/22/2021	Residential Adulticiding Requests completed (21)
7/26/2021	Resident Request Site Inspection - Knobb Hill
7/28/2021	Residential Adulticiding Requests completed (24)
7/28/2021	(3) Mosquito batch sent to DPH for EEE/WNV testing- Negative
7/30/2021	Resident Request Site Inspections and larvicide - Old Rowley Road (1.74 lbs. VectoMax FG)
8/2/2021	Adulticide Barrier Request completed- Triton HS (15.0 oz Suspend Polyzone)
8/2/2021	Adulticide Barrier Request completed- Newbury ES (6.0 oz Suspend Polyzone)
8/3/2021	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/5/2021	Residential Adulticiding Requests completed (19)
8/6/2021	Resident Request Site Inspections and larvicide - Hanover Street (2.73 lbs. VectoMax FG)
8/9/2021	Salt marsh dip station check- pre aerial application
8/10/2021	(4) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/10/2021	Aerial operation larvicide salt marsh- 625 acres
8/11/2021	Salt marsh dip station check- post aerial application
8/12/2021	Residential Adulticiding Requests completed (23)
8/17/2021	(6) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/18/2021	Residential Adulticiding Requests completed (24)
8/24/2021	(3) Mosquito batch sent to DPH for EEE/WNV testing- Negative
8/25/2021	Larviciding- (salt marsh) Plum Bush, Pine Island Road, Old PI Road, Seaview, Cottage (50.00 lbs. Vectobac-G)
8/25/2021	Larviciding- PI Research Station, Hay Street (40 lbs. Vectobac-G)
8/26/2021	Residential Adulticiding Requests completed (21)
8/28/2021	Resident Request Site Inspections- Main Street, Middle Road
8/31/2021	(5) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/2/2021	Residential Adulticiding Requests completed (22)
9/7/2021	Salt marsh dip station check- pre aerial application
9/8/2021	(13) Mosquito batch sent to DPH for EEE/WNV testing- 2 batches <b>WNV</b> positive (Ae. vexans, Cx. salinarius)
9/8/2021	Residential Adulticiding Requests completed (22)
9/8/2021	Aerial operation larvicide salt marsh- 200 acres
9/9/2021	Resident Request Site Inspections and larvicide- Middle Road, Wayside Ave (3.0 lbs. Vectobac-G)
9/9/2021	Larviciding- Hay Street (2.47 lbs. Vectobac-G)
9/9/2021	Pick up greenhead traps for season
9/10/2021	Salt marsh dip station check- post aerial application
9/10/2021	Pick up greenhead traps for season
9/13/2021	ULV block area adulticide with public notification in response to WNV activity on 9/8/2021
9/13/2021	Larviciding- Orchard Street (20.27 lbs. VectoMax FG)
9/14/2021	Adulticide Barrier request completed - Governor's Academy (6.0 oz Suspend Polyzone)
9/14/2021	Notified BOH- WNV risk raised by DPH to MODERATE
9/14/2021	(6) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/14/2021	Pick up greenhead traps for season

9/16/2021	Residential Adulticiding Requests completed (28)
9/21/2021	(7) Mosquito batch sent to DPH for EEE/WNV testing- Negative
9/28/2021	(5) Mosquito batch sent to DPH for EEE/WNV testing- 1 batch <b>WNV</b> positive ( <i>Cx. salinarius</i> )
10/1/2021	Adult mosquito surveillance and DPH testing concluded for season

- **311 residential adulticide (ULV) service requests, up from 181 in 2020**
- **3 Board of Health adulticide service requests (combined ULV and barrier treatments)**
- **8 residential property inspection service requests, up from 2 in 2020**  
Informing residents that they can contact the district to inspect for standing water and help identify new breeding areas can help reduce mosquito populations.
- **23 mosquito habitat site inspections**
- **Catch basin larviciding was completed on 7/14/2021: 548 total basins were treated (455 municipal + 93 school)**
- **2 Residential pesticide exclusions were filed with the district this year from Newbury**
- **1,850 feet of storm water ditches were cleared of debris**
- **24 abandoned tires were collected**

## 2021 Newbury Mosquito & Arbovirus Surveillance Summary

There were 3 WNV mosquito isolations. There were no EEE mosquito isolations, human or animal cases of WNV/EEE in Newbury in 2021. At the end of 2021, the arboviral risk level for Newbury remained at LOW for EEE and was raised to MODERATE for WNV on 9/14. 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.

- 54 mosquito pools/batches from historic traps were sent from Newbury to the MDPH lab for testing in 2021. 2 batches of mammal biting mosquitoes (*Cx. salinarius*, *Ae. vexans*) tested positive for WNV on 9/7.
- Following district virus response protocol, the BOH requested a small “block” area ULV adulticide which was completed on 9/13 and additional larviciding was performed.
- DPH raised the WNV risk level to moderate on 9/14 in Newbury.
- An additional mammal biting mosquito (*Cx. salinarius*) tested positive for WNV on 9/28 from another location. No adulticiding or supplemental traps following this positive as temperatures dropped and the MDPH lab ceased testing for the season on 10/1/2021. No mosquito batches tested positive for EEE during 2021.

## 2022 Best Management Practice Plan: Newbury

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

Trap Set Date	Species	Test Type	Result
9/7/2021	<u><i>Aedes vexans</i></u>	WNV	Positive
9/7/2021	<u><i>Culex salinarius</i></u>	WNV	Positive
9/28/2021	<u><i>Culex salinarius</i></u>	WNV	Positive
8/13/2018	<u><i>Culex salinarius</i></u>	WNV	Positive
7/15/2013	<u><i>Culex pipiens/restuans</i></u> complex	WNV	Positive
8/13/2012	<u><i>Culex pipiens/restuans</i></u> complex	WNV	Positive
8/13/2012	<u><i>Culex salinarius</i></u>	WNV	Positive
8/18/2012	<u><i>Culex pipiens/restuans</i></u> complex	WNV	Positive
8/20/2012	<u><i>Culex pipiens/restuans</i></u> complex	WNV	Positive
8/28/2012	<u><i>Culiseta melanura</i></u>	EEE	Positive
9/4/2007	<u><i>Culex pipiens/restuans</i></u> complex	WNV	Positive

<b>Total Mosquito Collected in Newbury</b>	<b>2020</b>	<b>2021</b>	<b>% Change</b>
Resting Boxes (8)- Bird feeders/EEE primary vectors	30	176	487%
CDC CO2/Light Traps (2) - Mammal feeders/bridge vectors	5,775	35,493	515%
Gravid Traps (2)- Bird feeders/WNV primary vectors	113	79	-30%
<b>Totals</b>	<b>5,918</b>	<b>35,748</b>	<b>504%</b>

<b>Mosquito Species- pest/disease list- Newbury</b>	<b>2020</b>	<b>2021</b>	<b>% Change</b>	<b>WNV/EEE +</b>	<b>District Total % Change 2020 to 2021</b>
<i>Culiseta melanura</i> (red maple swamp/acid bog)	2	17	750%	NO	11%
<i>Culex pipiens</i> (container/catch basins/heavy organics)	20	40	100%	NO	64%
<i>Culex restuans</i> (container/catch basins)	35	44	26%	NO	75%
<i>Culex salinarius</i> (brackish water/phragmites/roadside ditches)	813	14,270	1655%	WNV	747%
<i>Coquillitidia perturbans</i> (cattail)	2,114	2,955	40%	NO	-20%
<i>Aedes vexans</i> (rainwater/fresh floodwater)	384	4475	1065%	WNV	1781%
<i>Aedes japonicus</i> (tree hole/container breeder)	10	11	10%	NO	52%
<i>Aedes sollicitans</i> (salt marsh)	501	5,431	984%	NO	824%
<i>Aedes cantator</i> (salt marsh)	1,733	7,196	315%	NO	266%
<i>Aedes canadensis</i> (snowmelt/woodland pool)	7	130	1757%	NO	588%

Red denotes there were positive mosquito batches in the total collections during 2021

### WNV/EEE bridge vectors/mammal and bird biters

- Excessive and prolonged rain events during 2021 caused these species to increase district-wide, there was also an increase in multiple fresh floodwater species in Newbury; *Ae. vexans*, *Ae. canadensis* and *Cx. salinarius*, a brackish water mosquito, increased by 1,468%. Due to this increase, 2 batches of mosquitoes tested positive for WNV in Newbury, *Ae. vexans* and *Culex salinarius*. The cattail species *Cq. perturbans* have still not recovered from the drought conditions of 2020 and populations continued to decrease district wide. In Newbury, *Cq. perturbans* did increase by 40% 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 53% increase in collections of WNV primary vectors from 2020 to 2021 in Newbury. 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.

**EE** 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. Newbury did have an increase in populations of 750%. 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 even into some inland areas. Newbury did have an increase in populations of 984%.
- Newbury had a total of 3 salt marsh aerial operation larvicide treatments (1,675 acres) during 2021. June 23+24<sup>th</sup>, August 10<sup>th</sup> and September 8<sup>th</sup> (See summary of activities)

From July to the first hard frost, Newbury 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>

**Greenhead Traps:** The District deploys, collects, and maintains 87 greenhead traps in Newbury under the Northshore Greenhead Fly Program appropriation. This is a separate program and is not an expenditure under the Mosquito Control Program estimated assessment.