



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



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

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**2018 Best Management Practice Plan  
Haverhill**

**FY19 Percentage of assessment allocated to specific measures as prescribed by individual municipalities  
Best Management Practice (BMP) in the City of Haverhill**

NEMMC is requesting an increase of 7% in the assessment for FY 2019. NEMMC has been level funded in FY13, FY14, FY15, FY16 and FY17. In FY18 NEMMC received a 2% increase in its operating budget. In the past 6 years NEMMC has only requested a 2% increase in its operating budget or .33% average increase over the past 6 years. Our primary goal is to protect our subscribing communities from virus. We will do all in our power to reduce the mosquito populations on a regional and town wide basis, thus reducing the virus risk to our residents. We look for continued support and understanding from all the communities we serve if we are to be successful.

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.

FY19 Estimated District Budget for the City of Haverhill	\$ 121,356.98
FY19 State Reclamation and Mosquito Control Board (4.79%)	\$ 5,813.00
FY19 Total Estimated Assessment for the City of Haverhill	\$ 127,169.98

**District Control Measures specific to Haverhill**

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

## 2017 Haverhill Mosquito & Arbovirus Surveillance Summary

Above average mid to late summer temperatures mixed with sporadic localized rainfall events caused slight increases in snowmelt and floodwater mosquito populations such as *Oc. canadensis* and *Cx. salinarius*. Due to these same conditions; populations of container breeding mosquitoes increased significantly resulting in heightened WNV activity statewide. The number of positive mosquito pools “batches” reflected this increased WNV activity. At the end of the season most of the state remained at a drought level of Abnormally Dry.

District catch basin larvicide treatments in Haverhill were completed on 7/20/2017 (schools on 7/10/2017) and reduced *Cx. pipiens* populations breeding in this habitat type later in the season by 79% from 2016. A total of 5,097 basins were treated. Coordinating basin cleaning schedules with the DPW would result in earlier catch basin treatments potentially increasing the reduction in the early season *Cx. restuans*. Additional public education is needed to help reduce mosquito breeding on irrigated lawns, in abandoned pools, gutters, tires and unattended artificial containers on residential properties.

<b>Total Mosquito Collected in Haverhill</b>	<b>2016*</b>	<b>2017**</b>	<b>% change</b>
Resting Boxes (16)	140	30	-57%
CDC CO2/Light traps (1)	165	274	230%
Gravid Traps (2)	2,437	350	-71%
<b>Totals</b>	<b>2,742</b>	<b>654</b>	

<b>Mosquito Species- pest/disease list- Haverhill</b>	<b>2016*</b>	<b>2017**</b>	<b>Change</b>	<b>WNV/EEE ±</b>	<b>District Total-2017</b>
<i>Culiseta melanura</i> (red maple swamp/acid bog)	2	4	300%	NO	539
<i>Culex pipiens</i> (container/catch basins/heavy organics)	2,025	209	-79%	WNV	2,129
<i>Culex restuans</i> (container/catch basins)	289	127	-12%	WNV	937
<i>Culex salinarius</i> (brackish water/phragmities/roadside ditches)	11	82	33%	NO	9,618
<i>Coquillitidia perturbans</i> (cattail)	132	158	26%	NO	19,705
<i>Aedes vexans</i> (rainwater/fresh floodwater)	2	1	0%	NO	430
<i>Ochlerotatus japonicus</i> (tree hole/container breeder)	88	18	-27%	NO	469
<i>Ochlerotatus sollicitans</i> (salt marsh)	5	0	-100%	NO	872
<i>Ochlerotatus cantator</i> (salt marsh)	0	4	100%	NO	5,349
<i>Ochlerotatus canadensis</i> (snowmelt/woodland pool)	0	12	100%	NO	2,675

\*2016 Totals include all trap types in historical locations and 2 trap nights per week

\*\*2017 Totals include all trap types in historical locations and 1 trap night per week

(Although actual collections numbers are presented: to compensate for changes in collection frequency, 2016 totals were adjusted only to determine % of increase or decrease)

- 41 standard surveillance mosquito pools/batches were sent to the MA DPH lab for testing in 2017. The first WNV mosquito isolation was from bird biting species on 7/18/2017 collected from a gravid trap. The second isolation was also from bird biting species on 8/15/2017.

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- Supplemental CDC/CO2 light trapping events followed each positive WNV isolation. These traps are set to determine if mammal biting mosquitoes have potential for transmitting WNV and if adulticiding is needed to reduce risk. A total of 2 supplemental traps were set in Haverhill during the season but target mosquito species were not collected until 8/22. A supplemental CDC/CO2 light trapping event following the 8/15 positive WNV isolation resulted in 2 additional mosquito pools/batches sent to the MA DPH lab for testing. These pools/batches tested negative for WNV.

8/22/2017 (following the 8/15 WNV isolation)

3 *Cx. salinarius*

6 *Cq. perturbans*

There were **2 total WNV** detections and **no EEE** detections in Haverhill for 2017. There were also WNV infected mosquitoes collected from nearby Amesbury, North Andover and Georgetown resulting in increased arboviral risk levels. At the end of 2017, the arboviral risk level for Haverhill remained low for EEE and moderate for WNV. Risk Categories are described in Table 2 of the 2017 MDPH Surveillance and Response Plan.

### Mosquito infection history (WNV/EEE) in Haverhill:

Collection Date	Species	Test Type	Result
7/18/2017	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/15/2017	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/27/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/27/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/27/2013	<i>Culiseta melanura</i>	WNV	Positive
9/9/2013	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/15/2012	<i>Culex pipiens/restuans</i> complex	EEE	Positive
8/29/2012	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/26/2012	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/17/2011	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/7/2011	<i>Culex pipiens/restuans</i> complex	WNV	Positive
9/23/2009	<i>Culiseta melanura</i>	EEE	Positive
8/16/2006	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/16/2006	<i>Culex pipiens/restuans</i> complex	WNV	Positive
8/23/2006	<i>Culiseta melanura</i>	EEE	Positive

With the extensive forested wetlands in adjacent southeastern New Hampshire as the local focus of EEE virus, WNV/EEE history in Haverhill, WNV positive mosquitoes collected neighboring communities and no surveillance or control in Lawrence, there is concern of transmission and human infection by both viruses in Haverhill and all surrounding municipalities. July to the first heavy frost, Haverhill residents should take necessary precautions to reduce the risk of infection from these viruses, regardless of low mosquito populations and/or aggressiveness of control.

Refer to the 2017 Massachusetts State Arbovirus (MDPH) Surveillance and Response Plan viewed online at <http://www.mass.gov/eohhs/docs/dph/cdc/arbovirus/arbovirus-surveillance-plan.pdf>

## **Focus of Operations for 2018**

Regional control efforts will focus primarily on larval surveillance and treatment, adult mosquito surveillance, virus testing and preemptive virus intervention strategies. Specific to Haverhill the primary focus of control efforts will be on freshwater larviciding, catch basin treatments and virus intervention for WNV and EEE.

### **Regional Control Measures**

**Regional Adult Mosquito Surveillance Program:** CDC/CO<sub>2</sub> Light traps are used to sample the adult mosquito population, monitor both short and long term trends and determine population density of bridge vectors (human biters) of WNV and EEE. Gravid traps are designed to collect adult female *Culex* species the primary vectors (bird biters) of WNV.

One of these dual function units is placed in a fixed location in each member municipality for a total of 32 deployed throughout the District. Mosquitoes are collected and identified from each trap once per week beginning in early May through early October. The MA DPH may extend testing into October. In the event mosquitoes collected from these traps test positive for EEE or WNV the District will add supplemental CDC CO<sub>2</sub>/Light traps at specific sites within the municipality.

#### **Supplemental trapping criteria for 2018:**

After the 1<sup>st</sup> positive WNV/EEE primary vector species (bird biters) in any municipality supplemental traps could be placed in locations with these parameters:

- Radius of collection
- Distance from historic trap
- Topography
- Human population density
- Bridge vector potential breeding sites
- Schools/parks/recreation areas
- Site security
- Wetland/wooded/shaded/moist areas

Supplemental mosquito collections will be sent to State Laboratory for arbovirus testing.

The District will operate 128 resting boxes at 16 sites. Resting boxes are designed to collect blood fed female *Culiseta melanura* mosquitoes relevant to EEE transmission. Eight resting boxes will be placed at each fixed location and there will be two fixed locations in communities bordering New Hampshire as well as other communities considered to be at risk. The District will collect and identify samples from each trap every week and the specimens will be tested for virus.

In the event *Cs. melanura* mosquitoes collected from resting box sites test positive for EEE the District will deploy supplemental CDC CO<sub>2</sub>/Light traps at those sites.

**Virus Testing:** Specimens from our trap collections will be sent to The Massachusetts Department of Public Health (MA DPH) to be tested for the presence of encephalitis viruses. Our District mosquito testing results

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will be available on Fridays of each week. The MA DPH will contact the municipalities BOH officers as well as our District of any positive test results.

### Mosquito virus testing criteria for 2018:

#### Phase I

- June 15<sup>th</sup> to August 1<sup>st</sup>
- Primary vectors (Bird biters): *Cs. melanura*, *Cs. morsitans*, *Cx. pipiens* and *Cx. restuans*
- Other mosquito species may be tested on a case by case basis.

#### Phase II

- August 1<sup>st</sup> to October 1<sup>st</sup> (or October 15<sup>th</sup> for MA DHP extended season)
- Primary vectors (species listed above) + Bridge vectors (bird/mammal biters): *Ae. cinereus*, *Ae. vexans*, *Cq. perturbans*, *Cx. salinarius*, *Oc. canadensis*, *Oc. japonicus*, *Oc. taeniorhynchus*, *Ps. ferox* and *Oc. sollicitans*
- Other mosquito species may be tested on a case by case basis.

**Regional Vector/Virus Intervention:** Control efforts will focus on early intervention strategies in municipalities that have shown a greater risk to mosquito borne virus based on events of the previous seasons and surveillance data as prescribed in the District's [Integrated Pest and Vector Management Plan \(IPVMP\)](#). This approach is in the best interest of all member municipalities as focused early intervention strategies seem to demonstrate containment of WNV, and may reduce the risk of EEE exposure to humans and the migration of virus to other municipalities.

**Regional Aerial Salt Marsh Larviciding Program:** Coastal salt marshes in neighboring communities from Ipswich to the New Hampshire border will be aerially larvicided by helicopter to control salt marsh mosquitoes in accordance with the respective Best Management Practice Plans. Salt marsh mosquitoes are capable of flying up to 25 miles in search of a blood meal and then return to the salt marsh in order to lay eggs. Coastal communities as well as many inland cities and towns receive direct and immediate benefit from the control of salt marsh mosquitoes.

- Aerial bacterial larviciding operations in coastal communities (3 treatments in 2017). These applications provide relief from salt marsh mosquito (*Oc. cantator/Oc. sollicitans*) hatches for all municipalities in our District.

### Control Measures Specific to Haverhill

**Ground Larviciding:** Larviciding sites from the District's data base, including retention ponds, detention basins and areas requested by the local Board of Health will be checked and treated for mosquito larvae as necessary, beginning in March or as snow melt allows, to September 30<sup>th</sup> and beyond if circumstances warrant and conditions allow.

**Catch Basins:** Catch Basin treatments will be scheduled with local DPWs so that each municipality's annual cleaning of basins does not jeopardize the treatment and effectiveness of the larvicide used to control mosquito larvae in these basins. **The timing of catch basin cleaning is very important and will dictate what type of larvicide will be used to control the mosquito breeding in these basins.** BT/BS (bacterium) products

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work very well to control mosquito larvae in cleaned basins, but do not work well in uncleaned basins or ones high in organic matter. A Methoprene product would have to be used in uncleaned catch basins. Depending on the DPW's cleaning schedule, basins will be checked and treated as necessary beginning May 1st through August 31st.

**Manual Ditch Maintenance:** In the course of ground larviciding and catch basin treatments, roadside ditches and culverts will be manually cleared of manageable blockages and debris in order to reduce mosquito breeding habitat and / or potential habitat.

**Adulticiding:** The District uses a system called Ultra Low Volume (ULV) for ground adulticiding applications. ULV is designed to dispense very small amounts of pesticides over a large area. While this is a cost effective means of reducing mosquito populations on a large scale, it only affects those mosquitoes present at the time of the application and repeated applications are sometimes necessary to sustain the initial reduction in the mosquito population in some areas.

**Virus intervention will be at the request of and coordinated through the Board of Health with recommendations from Northeast MA Mosquito Control of specific areas to be targeted. Applications to schools must be in compliance with MGL ch85.**

- **Residential Pesticide Exemption:** Residents who request their property be excluded from pesticide applications must comply with the legal process to exempt their property. Pursuant to 333 CMR 13.03, individuals may request exclusion from wide area applications of pesticides by the District for the 2018 calendar year starting January 1<sup>st</sup> 2018. Requests **must be made to the Department of Agricultural Resources** online, and **will go into effect 14 days** from the date the request is received. All exclusion requests expire on December 31<sup>st</sup>, 2018. The exclusion request can be accessed from either our districts website or directly from the Department of Agricultural website:

<https://www.mass.gov/how-to/exclusion-from-wide-area-pesticides-application>

**Barrier Treatment:** To reduce the need for repeated ULV applications and provide more sustained relief from mosquitoes in high public use areas, the District can provide barrier treatments to public use areas such as schools, playgrounds, athletic fields, etc., at the request of the Board of health and/or school departments. **Applications to schools must be in compliance with MGL ch85.**

**Ditch Maintenance / Wetlands Management:** The town may petition the District to undertake larger scale ditch maintenance projects, wetlands enhancement and restoration projects requiring specialized mechanized equipment and expertise. Petitioned sites will be evaluated and a site specific proposal will be written for acceptable projects. Wetlands management projects may be beyond the scope of any municipality's assessment and may require a separate and additional appropriation.

**Tire Recycling Program:** Tires have historically been discarded on public and private properties, in both upland and wetland environments. Once a pile is started it can quickly grow into a substantial public health issue, not only as a source of mosquito proliferation but also as a potential fire hazard and as a source of toxic fumes, that once ignited can be extremely difficult to extinguish.

Discarded tires almost always hold water and are a prime location for artificial container breeding mosquito species, most notably *Culex pipiens*, *Culex restuans* and *Ochlerotatus japonicus*. *Cx. pipiens* and *Cx. restuans* are considered to be the key vector species of both encephalitis viruses in the District. *Oc. japonicus* is a new species to Massachusetts since 2000, and is thought to have been imported into the United States in used tires. *Oc. japonicus* has also shown to be a competent vector of West Nile virus. Invasive mosquito species, such as *Ae. albopictus* are known to travel in containers like tires. As in previous seasons, the District will be maintaining a tire water sample program in order to monitor any new species coming into the district.

**Property Inspection:** While the District is authorized under the provisions of Chapter 252, section 4 of the General Laws of the Commonwealth to enter upon lands for the purpose of inspection, it is not a regulatory agency. It also is not our intention to impose on any resident or business, but rather to be a resource for information and technology to help property owners prevent or abate mosquitoes to the mutual benefit of the property owner and the community.

Socioeconomics often plays an important role in mosquito control and associated public health risks. Over the last few years the District has received many requests from Boards of Health to inspect abandoned properties. With the increased health risk associated with property abandonment the District will take an aggressive approach to property inspections. In the course of our routine activities in your community, if we discover such properties, we will inspect and report these properties to the Board of Health. We understand that addressing concerns related to such properties is a matter of time and process. In the long term we will offer any support that may be appropriated to resolve mosquito problems related to such properties and in the short term with the Board of Health's support we will implement the necessary control measures to mitigate the immediate mosquito problem associated with such properties.

**Mosquito Habitat Mitigation:** The District will represent the town's mosquito control concerns in an advisory capacity relative to proposed development and where prudent as requested by local health officials.

**Research and Development:** The District will evaluate the efficacy and efficiency of current control methods, investigate new methods, procedures and technologies in mosquito control and wetlands management and evaluate their implications for use in Haverhill.

**Education and Outreach:** The District will present educational displays and programs on mosquito control and related wetlands management programs at the request of health officials, schools or civic organizations. The District will also monitor and update local schools, daycares etc. regarding IPM plans and current child protection requirements.

**Social Media:** In the recent past, the District has recognized the need to provide information on our activities in a timelier manner. Social media is proving to be the go to method of disseminating information for many companies and individuals.

The District maintains a valuable website. This site is full of resources, information and provides more timely updates of our activities. We have found that many questions can be answered through our website and we will continue to increase our web presence.