Commonwealth of Massachusetts

STATE RECLAMATION AND MOSQUITO CONTROL BOARD

NORTHEAST MASSACHUSETTS MOSQUITO CONTROL AND WETLANDS MANAGEMENT DISTRICT

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2021 Best Management Practice Plan

Merrimac

FY22 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 FY 2021 certified assessment for a FY 2022 operational budget. During FY 2021 the District experienced numerous changes in staff and increase in prices of materials. The District was not able to make the vehicle purchases it had planned to keep on schedule with our vehicle and equipment replacement plan. Our FY 2022 budget addresses funding for management changes, allow for one vehicle replacement, and establishes a plan to replace one of our frontline heavy equipment pieces that is presently 23 years old. It is always a challenge 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 to deal with exceptional mosquito nuisance and health issues. We have been deemed "essential" during Covid-19 and will continue to provide our subscribing municipalities the highest possible level of service.

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.

FY22 Estimated District Budget for the Town of Merrimac	$ 30,896.00
FY22 State Reclamation and Mosquito Control Board	$ 1,324.00
FY22 Total Estimated Assessment for the Town of Merrimac	$ 32,220.00

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.

Summary of NEMMC District Operations Completed in Merrimac during 2020

Date	Activity Completed
1/8/2020	NEMMC attendance at MDPH Local Public Health 2020 EEE Planning Forum
1/27/2020	2020 Integrated Pest and Vector Management Plan published to NEMMC website
1/31/2020	2020 Draft Best Management Plans (BMP) e-mailed to BOH for review
2/24/2020	NEMMC Meeting with Merrimac BOH re: BMP
3/23/2020	2020 Final Best Management Plans (BMP) published to NEMMC website
3/27/2020	Habitat Site Inspections (5)
4/25/2020	Residential Pesticide Exclusions Received (1)
4/28/2020	Larviciding- Hadley Road (1.97 lbs Vectobac-G)
4/28/2020	Habitat Site Inspections (10)
5/4/2020	Habitat Site Inspections (15)
5/4/2020	Larviciding- Winter St, Orchard St, West Main St (5.93 lbs Vectobac-G)
5/11/2020	Habitat Site Inspections (14)
5/15/2020	Habitat Site Inspections (17)
5/15/2020	Larviciding- Hadley Road (6.00 lbs Vectobac-G)
5/19/2020	Adult mosquito surveillance starts
6/17/2020	(1) Mosquito batches sent to DPH for EEE/WNV testing- Negative
6/23/2020	Contacted DPW for catch basin cleaning schedule and treatment notification
7/1/2020	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
7/8/2020	Catch basin larviciding (196 VectoMaxWSP) Helen Donahue School (17 VectoMaxWSP)
7/9/2020	Catch basin larviciding (598 VectoMaxWSP) Sweetser Elem School (6 VectoMaxWSP)
7/9/2020	Total catch basins in Merrimac completed- 794 basins + 23 school basins
7/15/2020	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative
7/30/2020	Residential Adulticiding Requests completed (1)
8/9/2020	Residential Pesticide Exclusion Received (1)
8/12/2020	(1) Mosquito batches sent to DPH for EEE/WNV testing- Negative
8/18/2020	Residential Pesticide Exclusion Received (1)
8/19/2020	(1) Mosquito batch sent to DPH for EEE/WNV testing- Negative

- **1 Residential adulticide (ULV) service request**
- **0 Residential property inspection service requests (down from 3 in 2019) & 0 BOH Larvicide service requests 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.
- **61 Mosquito habitat site inspections**
- **Catch basin larviciding was completed on 7/9/2020: 817 total basins were treated (794 municipal, 23 school)**
- **3 Residential pesticide exclusions were filed with the District this year from Merrimac**

2020 Merrimac Mosquito & Arbovirus Surveillance Summary

There were no WNV/EEE mosquito isolations, human or animal cases in Merrimac in 2020. At the end of 2020, the arboviral risk level for Merrimac remained at LOW for EEE and LOW for WNV. Risk Categories are described in Table 2 of the 2020 MDPH 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.

- 5 mosquito pools/batches were sent from Merrimac to the MDPH lab for testing in 2020, all batches tested negative for EEE/WNV.

Total Mosquitoes Collected in Merrimac	**2019**	**2020**	**% change**
Resting Boxes (16)- EEE primary vectors	72	18	-75%
CDC CO2/Light Traps (1) - Mammal feeders/bridge vectors	1,056	256	-76%
Gravid Traps (1)- WNV primary vectors	46	50	9%
Totals	**1,174**	**324**	**-72%**

Mosquito Species- pest/disease list- Merrimac	**2019**	**2020**	**% change**	**WNV/EEE +**	**District Total % Change 2019 to 2020**
Culiseta melanura (red maple swamp/acid bog)	28	9	-68%	NO	-81%
Culex pipiens (container/catch basins/heavy organics)	11	2	-82%	NO	-30%
Culex restuans (container/catch basins)	8	0	-100%	NO	-60%
Culex salinarius (brackish water/phragmites/roadside ditches)	17	11	-35%	NO	-80%
Coquillitidia perturbans (cattail)	750	216	-71%	NO	-70%
Aedes vexans (rainwater/fresh floodwater)	51	5	-90%	NO	-44%
Aedes japonicus (tree hole/container breeder)	23	6	-74%	NO	-57%
Aedes sollicitans (salt marsh)	0	1	-	NO	194%
Aedes cantator (salt marsh)	161	0	-100%	NO	-75%
Aedes canadensis (snowmelt/woodland pool)	6	0	-100%	NO	-95%

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/human biters

- Due to targeted larviciding, there was a decrease in the fresh floodwater species *Ae. vexans* of 90% and *Ae. canadensis* by 100%. Although the cattail species *Cq. perturbans* had made some recovery from consecutive years of drought with a population increase in 2019 (wet year), drought conditions coming into and during 2020 caused populations of this species to reduce by 71% in Merrimac. *Cx. salinarius*, a brackish water mosquito also decreased in Merrimac by 35%. There were no EEE and/or WNV isolates in these species during 2020. 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*)

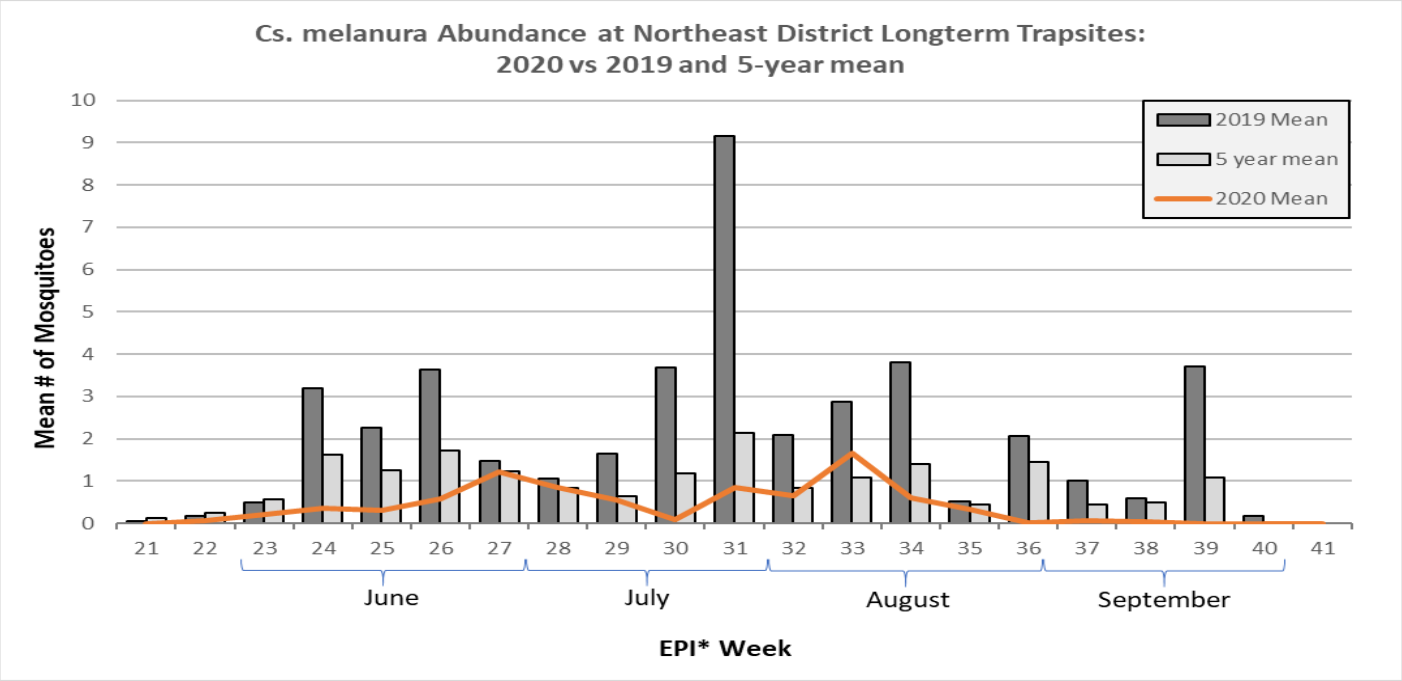
- There was an 89% decrease in collections of WNV primary vectors from 2019 to 2020 in Merrimac, timely catch basin cleaning and treatments helped keep *Culex* mosquito populations in check. Our District did have 1 WNV isolation from a batch of mosquitoes collected in Revere during 2020. Supplemental traps were placed following a block area adulticide and re-treatment of local catch basins. There were no subsequent WNV mosquito collections and there were no WNV human/animal cases. Informing residents that they can contact the District to inspect for standing water and help identify new breeding areas can also reduce these populations.

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

- *Ae. sollicitans:* Despite constant larviciding and adulticiding; tides, high temperatures, prevailing wind direction and infrequent but heavy thunderstorm activity caused this mosquito species to become a serious weekly nuisance for the District and its residents throughout 2020.

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

- Merrimac saw a 68% decrease in *Cs. melanura* collections during 2020. 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 March-April 2020 the District saw an 81% decrease in *Cs. melanura* populations from 2019 and a 70% decrease from the 5-year mean. The District did not have any mosquito, mammal or human EEE activity in 2020.



*An epidemiological week, commonly referred to as an epi week or a CDC week, is simply a standardized method of counting weeks to allow for the comparison of data year after year.

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 2020 MA Arbovirus Plan listed below).

Refer to the 2020 Massachusetts State Arbovirus Surveillance and Response Plan viewed online at:
https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data

Focus of Operations for 2021

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

- School IPM program coordinators should confirm all schools are updated for outdoor mosquito control with our District for 2021. Coordinators please call our office or visit the MDAR School IPM website at

https://massnrc.org/ipm/schools-daycare/ipm-tools-resources/ipm-plan-maker/make-your-ipm-online/locate-school-plan.asp# for more information.

Regional Control Measures

Regional Adult Mosquito Surveillance Program: CDC/CO2 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.

At least one of these dual function units is placed in a fixed location in each member municipality for a total of 36 deployed throughout the District. Mosquitoes are collected and identified from each trap once per week beginning mid-May until September 31st. MDPH 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 CO2/Light traps at specific sites within the municipality.

Supplemental trapping criteria for 2021:

After the 1st 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 CO2/Light traps in high-risk areas.

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 will be available on Thursdays of each week by 11:00 am. MDPH will contact the municipalities BOH officers as well as our District of any positive test results.

Mosquito virus testing criteria for 2021:

Phase I

- June 15th to August 1st
- 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 1st to October 1st or October 15th (for MDHP extended season)
- Primary vectors (species listed above) + Bridge vectors (bird/mammal biters): *Ae. cinereus, Ae. vexans, Cq. perturbans, Cx. salinarius, Ae. canadensis, Ae. japonicus, Ae. taeniorhynchus, Ps. ferox* and *Ae. 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 can fly up to 25 miles in search of a blood meal and then return to the salt marsh 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 2020). These applications provide relief from salt marsh mosquito (*Ae. cantator*/*Ae. sollicitans*) hatches for all municipalities in our District.

Control Measures Specific to Merrimac

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 30th 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 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 will 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 in some areas to sustain the initial reduction in the mosquito population.

Science based selective adulticiding of specific areas will be provided as follows: **By request of residents and/or the local Board of Health, not to exceed one day per week from June 1st to September 30th or as circumstances warrant and conditions allow. Virus intervention will be provided with recommendations from Northeast MA Mosquito Control of specific areas to be targeted.**

Per product label, NEMMC will not conduct adulticide applications when temperatures are below 50 F and/or when wind speeds exceed 10 mph.

Adulticide applications to schools must be in compliance with 333 CMR 14.08.

- ***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 2021 calendar year starting January 1st, 2021. 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 31st, 2021. 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.

Per product label, NEMMC will not conduct barrier applications when temperatures are below 50 F and/or when wind speeds exceed 10 mph and/or when precipitation is predicted within 24 hours of a barrier application.

Barrier applications to schools must be in compliance with 333 CMR 14.08.

Ditch Maintenance / Wetlands Management: The town may petition the District to undertake larger scale ditch maintenance projects, wetland 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. Wetland management projects must have a mosquito remediation component. Wetland 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 and is a known source of mosquito proliferation.

Discarded tires almost always hold water and are a prime location for artificial container breeding mosquito species, most notably *Culex pipiens*, *Culex restuans* and *Aedes japonicus*. *Cx. pipiens* and *Cx. restuans* are the key vector species of West Nile Virus in the District. *Ae. japonicus* is a new species to Massachusetts since 2000 and is thought to have been imported into the United States in used tires. *Ae. japonicus* has also shown to be a competent vector of West Nile virus. Invasive mosquito species are known to travel in containers like tires.

Aedes albopictus, an exotic invasive species, is now established in Central and Southern Massachusetts and has made an appearance in the Northeast District during 2018. This species has the potential for arbovirus transmission and breeds in discarded tires. As in previous seasons, the district will be maintaining tire water sample programs, tire collections and larviciding in order to monitor and control the spread of this species in 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.

The district receives many requests from municipal 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 Merrimac.

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.

The District's Liaison communicates information between participating Boards of Health, school officials, and District personnel to facilitate operational requests in member municipalities. The Liaison will distribute and review the BMPs with all participating Board of Health directors, contact school IPM coordinators who have not updated their IPM plans to include mosquito control products, and will act as a point of contact during the mosquito season for media outreach, municipal toolbox access and public information resources to local Boards of Health after notification of virus in a community.

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. Please visit us at www.nemassmosquito.org