

# MASSACHUSETTS MOSQUITO CONTROL

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## ANNUAL OPERATIONS REPORT



Year Report Covers: 2017      Date of Report: 01/31/2018

Project/District Name: **Bristol County Mosquito Control Project**

Address:            38R Forest Street

City/Town:        Attleboro

Zip: 02703

Phone:            508-823-5253

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**Report prepared by: *Priscilla Matton***

NPDES permit no. **MAG87B207**

If you have a mission statement, please include it here:

Bristol County Mosquito Control Project's Mission Statement

In conjunction with the belief that mosquito control is an important public health issue, the Bristol County Mosquito Control Project, under the guidance of the State Reclamation and Mosquito Control Board, strives to serve their membership communities by suppressing both nuisance and disease carrying mosquito populations.

Our goal is to bring mosquito populations to tolerable levels using a variety of scientifically effective methodologies consistent with applicable laws. Surveillance, water management, biological and chemical controls are performed in an environmentally sensitive manner to minimize potential effects on people, wildlife and the environment.

It is acknowledged that Commissioners live or work in the county and that all decisions be made in a fiscally responsible manner. The Project advocates public outreach and education through cooperative efforts with local officials, school departments and the news media.

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### ORGANIZATION SETUP:

**Commissioner names:**

Robert Davis

Gregory Dorrance

Joseph Barile

Christine Fagan

Aaron Caswell

\_\_\_\_\_

**Superintendent/Director name:** Priscilla Matton

**Superintendent/Director contact phone number:** 508-823-5253 X3

**Asst. Superintendent/Director name:**

**District/Project website:** <http://www.mass.gov\eea\bristolcountymosquitocontrol>

**Twitter handle:** @BCMCPMosq

**Facebook page:** <http://www.facebook.com/>

**Staffing levels for the year of this report:**

Full time: 12

Part time:

Seasonal: 2

Other: (please describe)

**Of the above, how many are:**

(Please check off all that apply, and list employee name(s) next to each category)

- ☒ Administrative Barbara Johnson, Priscilla Matton
- ☒ Biologist Todd Duval, Priscilla Matton
- ☒ Educator Priscilla Matton, Todd Duval
- ☒ Entomologist Todd Duval
- ☒ Facilities Priscilla Matton, John Moniz, Drew Bushee, John Pereira, Matthew Gavaza, Larry Goss, Anthony Souza, Joshua Nickerson, Peter Bilodeau, Todd Duval
- ☒ Information technology Diana Brennan, Priscilla Matton
- ☒ Laboratory Todd Duval, Priscilla Matton
- ☒ Operations Priscilla Matton, John Moniz, Drew Bushee, John Pereira, Matthew Gavaza, Larry Goss, Anthony Souza, Joshua Nickerson, Peter Bilodeau, Todd Duval, Diana Brennan
- ☒ Public relations Priscilla Matton, Todd Duval
- ☒ Wetland scientist Diana Brennan
- ☒ Other (please describe) Seasonal Mosquito Surveillance Technician- Greg Boyd, Seasonal Office Assitant- Teresa Beale

For the year of this report, the following were maintained (enter number in the column to the left):

- Modified wetland equipment (list type) Low- ground pressure excavators
  - Larval control equipment (list type) Backpack Sprayers
  - ULV sprayers (list type) 4 London Fog (GPS), 3 Guardian (GPS), 1 Curtis DynaJet (GPS), 1 Beecomist, 1 London Air
  - Vehicles
- Other (please be specific): 1 Dump Truck & Flatbed Trailer, 1 Utility Truck, 1 Utility Trailer, TD 7G Dresser Dozer, 2 Mower Attachments for Excavators

**Comments:** \_\_\_\_\_

How many cities and towns are in your service area?\* 20

Alphabetical list:

Acushnet  
Attleboro  
Berkley  
Dartmouth  
Dighton  
Easton  
Fall River  
Fairhaven  
Freetown  
Mansfield  
New Bedford  
North Attleborough  
Norton  
Raynham

Rehoboth  
Seekonk  
Somerset  
Swansea  
Taunton  
Westport

Were there any changes to your service area this year? No

Cities/towns added:

Cities/towns removed:

**\*Please attach a map of your service area (or a website link to that map).**

### INTEGRATED PEST MANAGEMENT (IPM):

Check off all services that your district/project currently provides to member cities and towns as part of an IPM program (details will be provided in the sections below):

- ☒ Adult mosquito control
- ☒ Adult mosquito surveillance
- ☒ Ditch maintenance
- ☒ Education, Outreach & Public education
- ☒ Larval mosquito control
- ☒ Larval mosquito surveillance
- ☐ Open Marsh Water Management
- ☒ Research
- ☒ Source reduction (tire removals)
- ☐ Other (please list):

Comments: \_\_\_\_\_

### LARVAL MOSQUITO CONTROL:

*If you have a larval mosquito control program, please fill out the section below, else skip ahead to the next section.*

Describe the purpose of this program: The larval suppression program is one of our most effective methods to reduce the number of biting mosquitoes by preventing mosquitoes from maturing into adults. We employ larviciding techniques to current and historical mosquito breeding sites to protect human health and improve the quality of life of our residents.

What months is this program active? April- September

Describe the types of areas where you use this program: BCMCP targets the following areas: freshwater wetlands, saltmarshes, cedar and red maple swamps, catch basins, other permanent and temporary water bodies, and artificial containers that hold water for extended periods of time.

Do you use:

- ☒ Ground application (hand, portable and/or backpack, etc.)

☒ Aerial applications

☐ Other (please list):

Comments: \_\_\_\_\_

List all products that you use for larval mosquito control in the table below (leave blank if not applicable):

Product Name	EPA #	Application Rate(s)	Application Method	Targeted life stage	Habitat Type	Total finished product applied
FourStar CRG	85685-2	7.5- 20 lbs per acre	Hand	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	3537 lbs
VectoLex WSP	73049-20	1 per 50 Sq. ft.	Hand	Larvae	<input checked="" type="checkbox"/> Catch basins <input checked="" type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	518.53 lbs
VectoMax WSP	73049-429	1 per 50 Sq. ft.	Hand	Larvae	<input checked="" type="checkbox"/> Catch basins <input checked="" type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	190.36 lbs
VectoBac 12AS	73049-38	1 pint per acre	Aerial	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	390 gallons
VectoLex WDG	73049-57	8 fl.oz per acre	Backpack	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Other (please list): tires, containers	72 oz.
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	

List all products that you use for larval mosquito control in the table below (leave blank if not applicable):

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				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	

What is your trigger for larviciding operations? (check all that apply)

- ☒ Best professional judgment  
☒ Historical records  
☒ Larval dip counts – please list trigger for application: 1+ per 5 dips  
☐ Other (please describe):

**Comments:** Our larval monitoring sites have GPS coordinates and are mapped for use in the applicator's computer. An aerial larvicide application was conducted over the Hockomock, Pine and Dead Swamps at the end of April 2017. Approximately 3,032 acres were treated to control a variety of spring species and Cs. melanura, an important EEE vector.

**Please attach a map of your service area (or a website link to that map). Figure 2 and Figure 3**

### ADULT MOSQUITO CONTROL:

*If you have a larval mosquito control program, please fill out the section below, else skip ahead to the next section.*

Describe the purpose of this program: When larviciding is not a viable option, targeted adulticiding applications are used. BCMCP's program is designed to decrease the number of vector and nuisance mosquitoes. There has been consistent detection of West Nile virus and/or Eastern Equine Encephalitis in our county. During the 2017 season, Bristol County had one human case of WNV in New Bedford. In 2011, one human death was reported from EEE. There were no human cases in Bristol County in 2013, 2014, 2015 and 2016.

What is the time frame for this program? Late May- mid-September

Describe the types of areas where you use this program: BCMCP accepts requests for adult mosquito control applications from residents, businesses, town officials and other organizations within our 20 towns. ULV applications normally take place in residential, recreational areas and in response to WNV or EEE detections from mosquito traps or positive animal/human cases.

Do you use:

- ☐ Aerial applications  
☒ Portable applications  
☒ Truck applications  
☐ Other (please list):

**Comments:** Mavrik was used solely to treat tires and containers for Ae. albopictus and associated species.

For each product used, please list the name, EPA #, and application rate(s):

Product Name	EPA #	Application Rate(s)	Application Method	Total finished product applied
Zenivex RTU	E4 2724-807	1.32 oz/acres	Truck mounted ULV	1,245 gallons
Mavrik	2724-478	0.5 fl. oz/ 5 gallons water	Backpack	7.5 gallons




Please describe the maximum amounts or frequency used in a particular time frame such as season and areas

Frequency of applications are dependent upon vector control activities, physical characteristics of the area and/or environmental issues. Applications are made in accordance with label directions.

What is your trigger for adulticiding operations? (check all that apply)

- ☒ Arbovirus data
- ☒ Best professional judgment
- ☒ Complaint calls (Describe trigger for application: Upon resident's request)
- ☒ Landing rates (Describe trigger for application Normally not conducted in Bristol County due to the risk of WNV or EEE, however with the introduction of Ae. albopictus this is a reliable tool. 2 adults within 5 minutes)
- ☒ Light trap data (Describe trigger for application See the EIR)

**Comments:** \_\_\_\_\_

**Please attach a map of your service area (or a website link to that map). Figure 4**

### **SOURCE REDUCTION (Tire Removals)**

*If you practice source reduction methods, such as tire removal, please fill out the section below, else skip ahead to the next section.*

Please describe your program:

BCMCP removes containers and other articles that would serve as larval habitat. We often inspect properties and offer advice to landowners and businesses on how to reduce and remove standing water or any other materials that would be conducive to mosquito habitat.

What time frame during the year is this method employed? Year round

**Comments:** BCMCP does not have a dedicated tire removal program, however tires are removed from areas where work is conducted on a limited basis.

### **WATER MANAGEMENT/DITCH MAINTENANCE**

*If you have a water management or ditch maintenance program, please fill out the section below, else skip ahead to the next section.*

Please check all that apply:

- ☒ Inland/freshwater
- ☒ Saltmarsh

Please describe your program: Our goal is to remove debris, sediment and vegetation from drainage ditches throughout our service area to improve water flow, thus eliminating standing water conducive to larval development. This includes both hand and mechanized work. We use erosion control materials and re-seed to stabilize soils disturbed by our operations. This is an important part of our IPM strategy and data and records are collected in accordance with the BMP.

For **inland/freshwater water management**, check off all that apply.

Maintenance Type	Estimate of cumulative length of culverts, ditches, swales, etc. maintained (ft)
<input checked="" type="checkbox"/> Culvert cleaning	
<input checked="" type="checkbox"/> Hand cleaning	80,580
<input checked="" type="checkbox"/> Mechanized cleaning	14,500
<input checked="" type="checkbox"/> Stream flow improvement	
<input checked="" type="checkbox"/> Other (please list): Reclaim	81,580

**Comments:** Culvert cleaning and stream flow improvement cumulative length are included in mechanized and hand cleaning. Cumulative mechanized brush mowing 10 acres

For **saltmarsh ditch maintenance**, check off all that apply:

Maintenance Type	Estimate of cumulative length of ditches maintained (ft)
<input checked="" type="checkbox"/> Hand cleaning	5,945
<input checked="" type="checkbox"/> Mechanized cleaning	525
<input checked="" type="checkbox"/> Other (please list): Reclaim	5,945

**Comments:** \_\_\_\_\_

What time frame during the year is this method employed? Year round

**Comments:** Monitored 38,265 ft of previously maintained ditches to confirm site stabilization and work efficacy. Completed 25 mechanized water management projects.

**Please attach a map of ditch maintenance areas (or a website link to that map). Ditch maintenance occurred throughout our County in all 20 towns/cities. Individual maps of specific areas are available upon request but are too large to attach.**

## OPEN MARSH WATER MANAGEMENT

*If you have an Open Marsh Water Management program, please fill out the section below, else skip ahead to the next section.*

Describe the purpose of this program: Open Marsh Water Management is a technique which provides greater access for small fish which eat mosquito larvae present in the marsh habitat easier passage. This can reduce the need for mosquito adulticiding in the immediate neighborhood. OMWM can also prevent the encroachment of invasive plants and provides better habitat for waterfowl and other birds.

What months is this program active?

Please give an estimate of total square feet or acreage:

**Comments:** BCMCP did not renew its federal OMWM permit following its expiration. If a project required activities not covered under the ACOE MA PGP, an individual permit with Army Corp and all other relevant permits would be obtained for a specific job.

**Please attach a map of OMWM areas (or a website link to that map).**

## **MONITORING (Measures of Efficacy)**

**Describe monitoring efforts for each of the following:**

Aerial Larvicide – wetlands: Standard protocol is to take pre- and post- dip larval counts from predetermined locations within the treatment wetlands. Non-treated locations would be used to correct for normal variation in populations.

Ground ULV Adulticide: To monitor efficacy, species targeted mosquito traps are placed in a location where ground ULV applications will take place. Pre- and post- trapping is necessary as is comparing to a non-treatment site to determine normal fluctuations due to other factors such as temperature and wind speed.

Larvicide – catch basins: Random samples of water are taken from catch basins in each town to assess larval populations.

Larvicide-hand/small area BCMCP conducts pre- and post- application dipping at numerous locations throughout the treatment site using a standard 350ml dipper.

Open Marsh Water Management: Please note the OMWM standards published in the EIR

Source Reduction: We return to all mechanized water management sites multiple times per season to check for blockages or debris that may obstruct the flow of water and to meet any additional requirements in the BMP. In areas where containers or tires were removed, some sites are re-checked during the season.

Other (please list): Due to the presence of the invasive mosquito *Ae. albopictus* in our county, an aggressive adult monitoring effort using multiple trap types has been implemented in the affected area.

Provide or list standard steps, criterion, or protocols regarding the documentation of efficacy (pre and post data), and resistance testing (if any):

**Pre and post collection of data is analyzed for all types of applications. More information is available in the EIR.**

Check the boxes below, indicating if your program has performed any of the following:

<b>Research Project</b>	<b>Details</b>
Bottle assays	Bottle assays were conducted using CDC protocols. These

	assays confirmed the efficacy of adulticides in use.
Efficacy testing	To monitor efficacy, mosquito traps, appropriate to a specific species, are placed in a location where ground ULV applications will take place. Pre- and post- trapping is necessary as is comparing to a non-treatment site to determine normal fluctuations due to other factors such as temperature and wind speed.
Other: Ae. albopictus	Pre- and post treatment larval surveillance
Other:	

## ADULT MOSQUITO SURVEILLANCE

*If you have an adult mosquito surveillance program, please fill out the section below, else skip ahead to the next section.*

Describe the purpose of this program: Surveillance is the cornerstone of IPM and an important part of the services we offer to member municipalities. The purpose of surveillance is to monitor for human health threats from mosquito-borne arboviruses, as well as to determine mosquito populations and diversity for appropriate control methods.

What months is this program active? April- early November

Check off all trap types currently in use by your program:

- |  |                                 |
|--|---------------------------------|
| <input type="checkbox"/> ABC light traps   | <input type="checkbox"/> Canopy |
| <input type="checkbox"/> ABC light traps w/CO <sub>2</sub>                                   | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> CDC light traps  | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> CDC light traps w/CO <sub>2</sub>                        | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> Gravid traps   |                                 |
| <input checked="" type="checkbox"/> Landing rate tests                                       |                                 |
| <input checked="" type="checkbox"/> NJ light traps   | <input type="checkbox"/> Canopy |
| <input type="checkbox"/> NJ light traps w/CO <sub>2</sub>                                    | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> Ovitrap  |                                 |
| <input checked="" type="checkbox"/> Resting boxes  |                                 |
| <input checked="" type="checkbox"/> Other (please describe): BG Sentinel Traps and GAT traps |                                 |

Do you maintain long-term trap sites in any of your areas? Yes

If yes, please describe how you chose these long-term sites:

Locations were chosen on a variety of factors including: wetlands habitat, locations of MA DPH long-term trap sites, arbovirus surveillance data, human or animal arbovirus cases and mosquito community composition.

Please check off the species of concern in your service area:

- |  |                                       |
|--|---------------------------------------|
| <input checked="" type="checkbox"/> Ae. albopictus | <input type="checkbox"/> Ae. cinereus |
|--|---------------------------------------|

- ☒ *Ae. vexans*  
☐ *An. punctipennis*  
☐ *An. quadrimaculatus*  
☒ *Cq. perturbans*  
☒ *Cx. pipiens*  
☒ *Cx. restuans*  
☒ *Cx. salinarius*  
☒ *Cs. melanura*  
☐ *Cs. morsitans*  
☒ *Oc. abserratus*  
☐ Other (please list):

- ☒ *Oc. canadensis*  
☐ *Oc. cantator*  
☒ *Oc. j. japonicus*  
☒ *Oc. sollicitans*  
☒ *Oc. taeniorhynchus*  
☐ *Oc. triseriatus*  
☐ *Oc. trivittatus*  
☐ *Ps. ferox*  
☐ *Ur. sapphirina*

Do you participate in the MDPH Arboviral Surveillance program? Yes  
 How many pools do you submit weekly on average? 21.7

Number of traps in your service area **placed by MDPH**: 12  
 Were these long-term trap sites or supplemental trapping sites? both

Which arboviruses were found in your area during the previous mosquito season? Enter the number of pools/cases below:

Arbovirus	Positive Mosquito Pools	Equine Cases	Human Cases
<input checked="" type="checkbox"/> Eastern Equine Encephalitis (EEE)	1	0	0
<input checked="" type="checkbox"/> West Nile Virus (WNV)	15	0	1
<input type="checkbox"/> Other (please list):			

Comments: \_\_\_\_\_

For each arbovirus listed below, please list the risk levels in your project area at both the start and end of the season (if more than one, please list all):

Arbovirus	Start of Season	End of Season
EEE	Low	Low
WNV	Low	Low- North Attleboro, Mansfield, Easton, Somerset, Fall River, Freetown, Berkley, Raynham, Westport. All others are Moderate (11)

Comments: Please see the attached end of the mosquito season report and mosquito response log.

## EDUCATION, OUTREACH & PUBLIC RELATIONS

If you have an education/outreach program, please fill out the section below, else skip ahead to the next section.

Describe the purpose of this program: Education is an important component of the Project's objectives to reduce arbovirus risk in the County. Speaking with the public allows us the opportunity to address any questions and misunderstandings about the program and the pesticides we use. We educate our residents on ways they can protect themselves from mosquito bites and reduce their risk of illness. We also educate our residents on simple mosquito source reduction techniques for their own properties.

What time frame during the year is this method employed? All Year

Check off all education/outreach methods that were performed by your program this year:

- ☒ Development/distribution of brochures, handouts, etc.
- ☒ Door-to-door canvassing (door hangers, speaking to property owners, etc.)
- ☒ Facebook page, Twitter, or other social media
- ☐ Mailings (Describe target audience(s): )
- ☒ Media outreach (interviews for print or online media sources, press releases, etc.)
- ☒ Presentations at meetings
- ☒ School-based programs, science fairs, etc.
- ☒ Tabling at events (local events, annual meetings, etc.)
- ☒ Website
- ☒ Other (please describe): Radio interviews, Councils on aging and housing authority presentations, local Board of Health fairs, local farmer's markets. Filmed PSA for local communities on mosquito control and prevention.

Estimate the audience reached this year using the education/outreach methods above: ~6500  
Comments: We are unable to estimate the audience for our TV, radio and print media interviews.

List your program's top 3 education/outreach activities for this year:

1. Capron Park Zoo, Zoo Moon event, July
2. Attleboro Farmer's Market, June
3. Spring Show with Bristol County Agricultural High School, May

Were you involved in any collaborations with the following partners this year? Provide details below, including a list of technical reports, white/grey papers, journal publications, trade magazine articles, etc:

- ☒ Academia Priscilla is a member of the Bristol Agricultural High School 's Natural Resource Management Advisory Board and the Taunton High School's Science Curriculum working group. Participated in a STEM program at Seekonk High School. Provided mosquito specimens for Louisiana State University.
- ☒ Another mosquito control district/project Continuation of Cs. melanura surveillance at the Bolton Cedar swamp in Freetown in conjunction with Plymouth Co. MCP. Collaboration with Central MA MCP on ongoing spring woodland pool larvicide study. Ae. albopictus coordination including conducting a one day workshop for other MCPs.
- ☒ Another state agency (DCR, DPH, etc.) Steady cooperation with DPH on Ae. albopictus concerns, including meeting with local town officials in Bristol County.

- ☒ Environmental groups Save the Bay and Dartmouth Natural Resources Trust on water management projects.
- ☒ Industry BCMCP participated in a Cq. perturbans emergence study with Clarke.

List any training/education your staff received this year: AMCA Annual meeting, NMCA Annual Meeting, NMCA Field Day, Dig Safe training seminar (in Taunton), Mosquito Control training seminar sponsored by Clarke, continuing education for those with MA Hoisting License. Multiple state required training through PACE. Entomologist Todd Duval participated in the CDC/AMCA Certified Trainer for Integrated Mosquito Management and AMCA Young Professional training group.

Please list the certifications and degrees held by your staff:

Priscilla Matton: B.S. Zoology, M.S. Entomology, MA Pesticide Applicator Certification (47).  
 Drew Bushee: MA Pesticide Certification (47), CDL license, Hoisting license.  
 John Moniz: Licensed MA Pesticide Applicator, CDL license, Hoisting license.  
 Todd Duval: B.A. Aquatic Biology, M.A. Biology, MA Pesticide Applicator Certification (47), OSHA 10 hour certification, CDC/AMCA Certified Trainer for Integrated Mosquito Management.  
 Joshua Nickerson: Licensed MA Pesticide Applicator, CDL license, Hoisting license.  
 Matthew Gavaza: Licensed MA Pesticide Certification (47)  
 Anthony Souza: Licensed MA Pesticide Certification (47)  
 Larry Goss: Licensed MA Pesticide Certification (43)  
 John Pereira: Licensed MA Pesticide Applicator  
 Peter Bilodeau: Licensed MA Pesticide Applicator  
 Diana Brennan: B.S. Environmental Science and Management, Licensed MA Pesticide Applicator

**Comments:** \_\_\_\_\_

### INFORMATION TECHNOLOGY (IT)

Does your program use (check all that apply):

- ☒ Aerial Photography
- ☒ Databases
- ☐ Dataloggers (monitoring for temperature, etc.)
- ☒ GIS mapping (Describe: BCMCP maps water management projects, trap locations, larval and adulticide locations. Utilizing ArcGis Online to quickly share data in-house.)
- ☒ GPS equipment
- ☒ Smartphones
- ☒ Tablets/Toughbooks
- ☒ Other (please describe): Web-based service request system and automatic service request closing application from truck's GPS data

Describe any changes/enhancements in IT from the previous year: BCMCP purchased from Frontier Precision a service request modular to enter in residential data. This information is then provided to the applicators for each town. On the ULV equipment, the Monitor 4 records the applicators location, date, time and pesticide usage. This information is downloaded into the service request modular and closes any outstanding request based on GPS application data.

Describe any difficulties your program had with IT software/equipment this year: Many of the issues experienced last year have been fixed.

**Comments:** \_\_\_\_\_

## REVENUES & EXPENDITURES

Please provide the amounts for your approved budgets for the current, previous, and future fiscal years. Please note if the budget for the next fiscal year is an estimate, or put "n/a" if it is not yet available.

Fiscal Year	Approved Budget
FY 17	\$1,388,955.00
FY 18	\$1,416,734.00

List each member municipality, along with the corresponding (cherry sheet) funding assessment dollar amount, for the current fiscal year (or provide a web link to this information):

Please see attached FY 18 Cherry Sheet Assessment

**Comments:** Figure 5

## SERVICE REQUESTS

How many service requests did you receive this season? 11,239

How many were for larviciding? 98

How many were for adulticiding? 11,150

Was this an increase or decrease over last season? Decrease

**Comments:** This represented a 8% decrease in adult spray requests compared to 2016. However, spray request may not represent actual number of properties treated. Often entire neighborhoods of 20-75 households will be recorded a single request with directions for the applicator. BCMCP is also representing larvicide request differently this year. These are request new to the Project and not currently on our historical larvicide maps.

## EXCLUSIONS

How many exclusion requests did you receive this season? 57

Was this an increase or decrease over last season? Decrease

Do you have large areas of pesticide exclusion, such as estimated or priority habitats? Yes

If yes, please explain, and attach maps or a web link if possible. Large areas include the Canoe River and Hockomock ACEC and areas of priority habitat. Map of areas are attached, Figure 6.



## SPECIAL PROJECTS

Did your program perform any of the following special projects? Check all that apply.

- ☒ Inspectional services (inspections at sewage treatment facilities, review of subdivision plans, etc.)

Describe: BCMCP meet with and discussed a source reduction plan with 2 separate tire facilities and an abandoned lot located in New Bedford where the invasive Ae. albopictus has been collected. The plan includes reducing the amount of time tires remain before being processed, cleaning up the work site and pesticide interventions. Worked in residential yards in response to request. This is a long term plan to reduce the spread and abundance of Ae. albopictus in the area. Also responded to unique detections as they occurred.

- ☒ Work with DPW departments or other local or state officials to address stormwater systems, clogged culverts, or other areas identified as man-made mosquito problem areas

Describe: Routinely work with member Cities, Towns, and local government agencies such as; local DPW's, Health Boards, and Conservation Commissions. At the State level we have worked with Mass DOT, DCR, and DER. Coordinate with these agencies to provide dump trucks to remove spoil and debris from work sites and clear culverts using specialized equipment. Some provide material in areas we are working in.

- ☒ Work with groups as described above on long term solutions?

Describe: Working with local airports on long term vegetation plans for greater visibility. Working with the Bristol County House of Corrections on stormwater management. Work with the City and the Fall River Industrial Park to address their extensive drainage ditch system.

- ☒ Conduct or participate in any cooperative research or restoration projects?

Describe: Bristol MCP conducted cooperative research with Plymouth MCP on aerial droplet testing, Cs. melanura control. Worked with Eastern Mass MCPs on Ae. albopictus surveillance. Woodland pool research with Central MA MCP. Worked with "Save the Bay", town of Dighton and DFW on a salt marsh restoration project on Broad Cove.

- ☒ Participate in any state/regional/national workgroups or panels, or attend any meeting pertaining to the above?

Describe: AMCA, NMCA Field Day, NMCA annual meeting, and hosted 2-day MA DPH Ae. albopictus workshop. Attended a workshop "Addressing impaired hydrology for salt marsh resiliency" at Parker River National Wildlife Refuge. Meeting with Dartmouth Natural Resource Trust and partners to address ongoing salt marsh issues. Meeting with

other Mosquito Control Water Management staff to review policy and procedures. Participated in MA DPH's ongoing surveillance meetings.

- ☒ Work on any biological control projects, such as enhancement of habitat for native predators, release of predatory fish or invertebrates, etc.?

Describe: Conducted water management activities to open beach crossing in many coastal towns to allow fish access to saltmarshes that were blocked due to winter storms.

#### **CHILDREN AND FAMILIES PROTECTION ACT (CFPA)**

Is your program impacted by the CFPA? Yes

If yes, please explain: Some local schools and day cares are out of compliance regarding our current mosquito control products, despite emails to administrators. The large number of schools and daycares create no spray zones that are marked on applicator's maps.

If you have data on compliance rates with the CFPA within your program area, please list here: MDAR's compliance rates for IPM development and submissions has not been updated since 2011.

Describe any difficulties you have had with the implementation of your program due to the CFPA, please elaborate here: When schools are not up to date on all the required information and notification policy, providing services to them in a timely manner, especially when virus is detected can be difficult and time consuming.

Comments: Figure 7 is a map of schools, daycares, certified organic farms and residential exclusions.

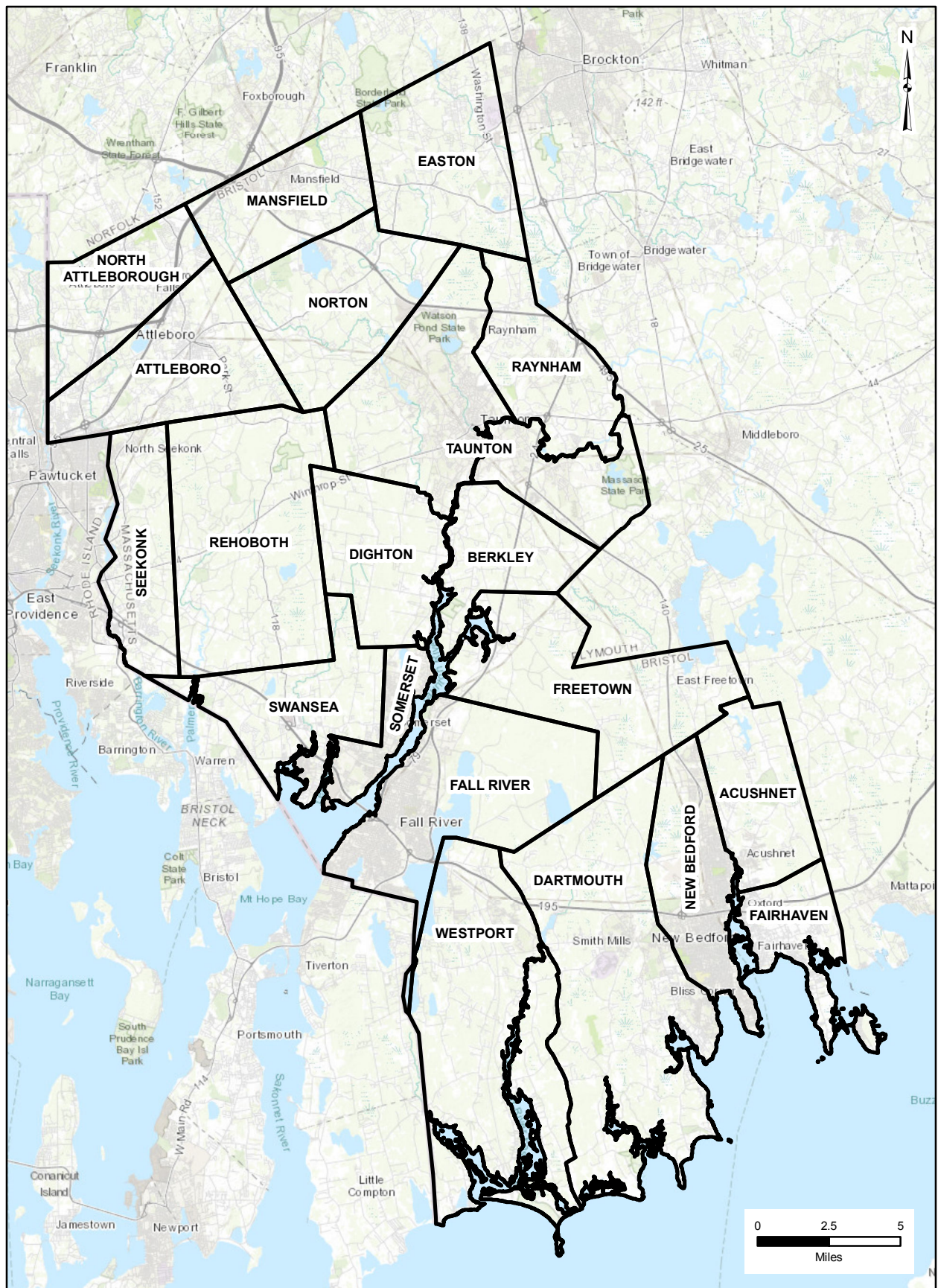
#### **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM**

Did your program report any adverse incidents during this reporting period? No

If yes, please list any corrective actions here: \_\_\_\_\_

#### **GENERAL COMMENTS**

Please add any comments here for topics not covered elsewhere in this report: \_\_\_\_\_



**Figure 1. Bristol County**



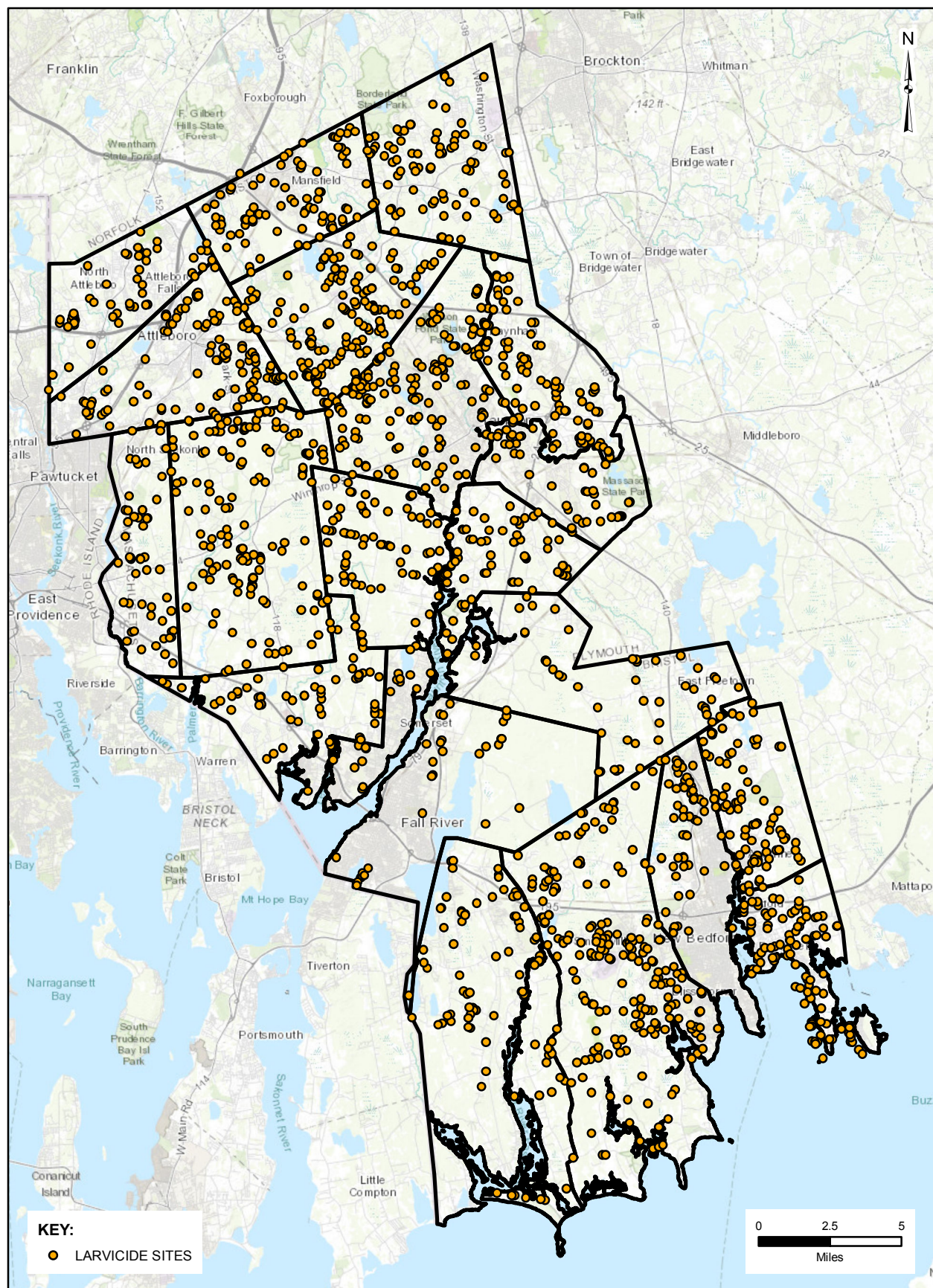
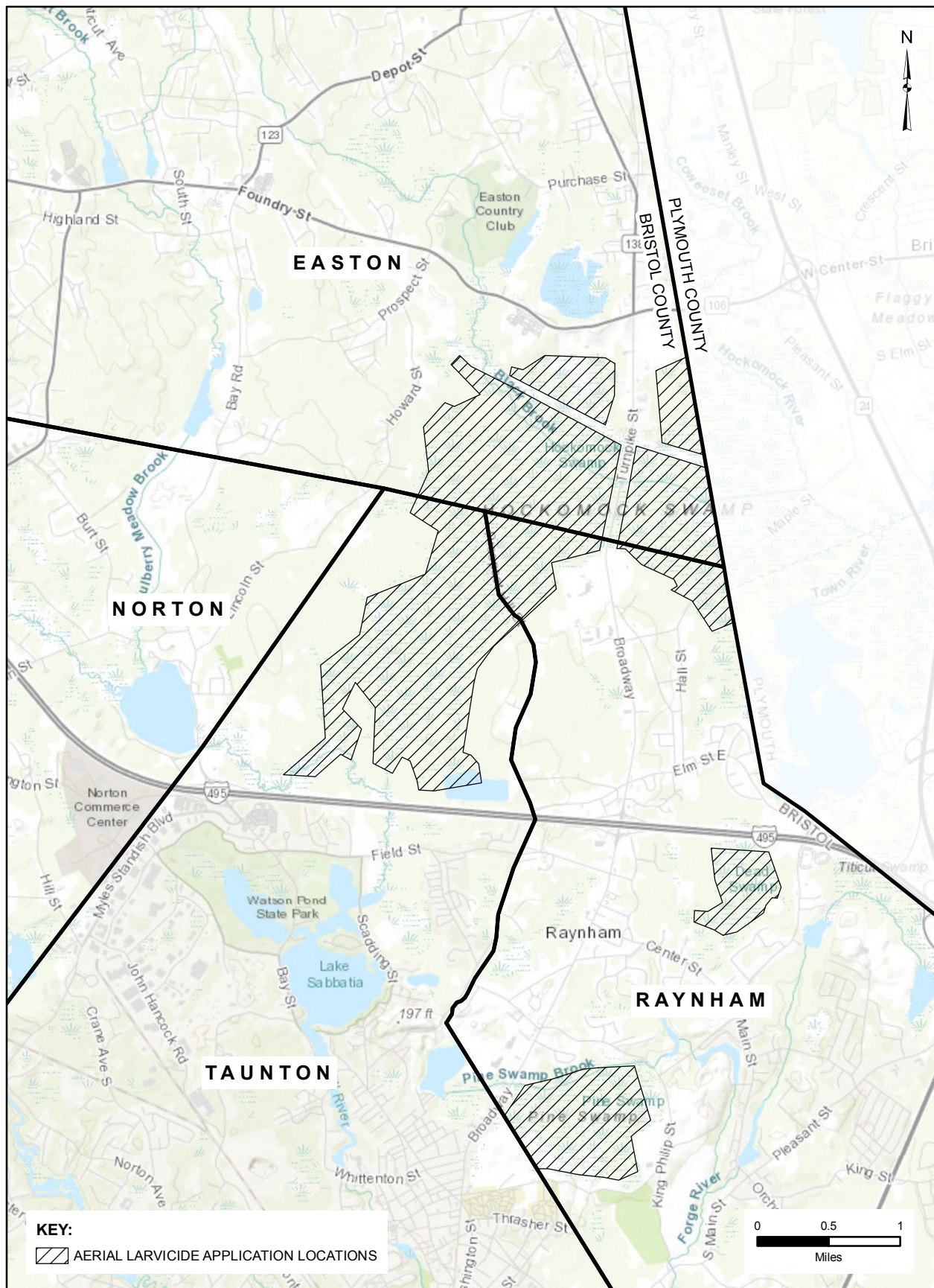


Figure 2. 2017 Larvicide Sites





**Figure 3. Aerial Larvicide Application Locations within Bristol County**



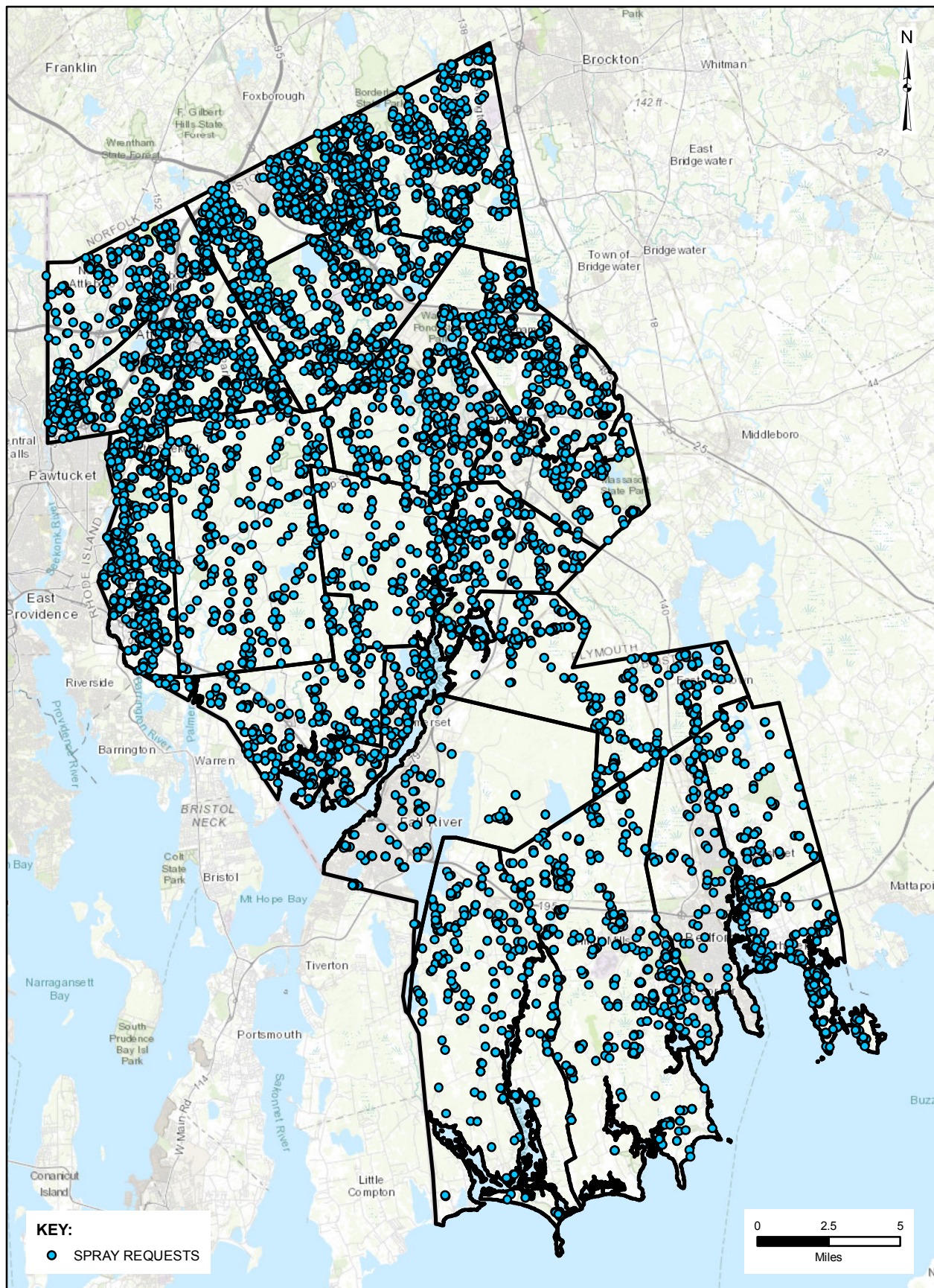


Figure 4. 2017 Spray Requests



THE COMMONWEALTH OF MASSACHUSETTS  
STATE RECLAMATION AND MOSQUITO CONTROL BOARD



## BRISTOL COUNTY MOSQUITO CONTROL PROJECT

38R FOREST STREET, ATTLEBORO, MA 02703  
TEL: (508) 823-5253 FAX: (508) 828-1868

COMMISSIONERS  
ROBERT F. DAVIS, CHAIRMAN  
GREGORY D. DORRANCE  
CHRISTINE A. FAGAN  
JOSEPH BARILE  
AARON G. CASWELL

SUPERINTENDENT  
PRISCILLA MATTON, MS

Monday, November 13, 2017

### Bristol County Mosquito Control Project (BCMCP) End of the 2017 Season Report

This report is based on data collected from CO<sub>2</sub>-baited CDC traps, resting boxes, gravid traps, ovitraps and BG Sentinel™ Traps.

- **Total Pools Submitted for Testing 2017: 804**
  - + 33% change from 2016
  - Total Pools Submitted for Testing 2016: 604
- **Total Pools Submitted from Bristol Co. by MA DPH in 2017: 283**
  - + 32% change from 2016
  - Total Pools Submitted for Testing 2016: 215
- **Total Number of Mosquitoes Tested in 2017: 23,187**
  - + 46% change from 2016
  - Total Number of Mosquitoes Tested in 2016: 15,877

- **Total Number of Mosquitoes Tested from Bristol Co. by MA DPH in 2017: 8,635**
  - + 45% change from 2016
  - Total Number of Mosquitoes Tested in 2016: 5,954
  - Total Number of Mosquitoes Tested in 2015: 3,243
  
- **Total Number of Non-submitted Mosquitoes 2017: 23,518**
  - + 14% change from 2016
  - Total Number of Non-submitted Mosquitoes 2016: 20,699
  
- **Total Number of Non-submitted Mosquitoes from Bristol Co. by MA DPH, 2017: 6,839**
  - + 75% change from 2016
  - Total Number of Non-submitted Mosquitoes 2016: 3,909

**2017 Combined Data:**

**Total Pools Tested: 804**

**Total Mosquitoes Tested: 23,187**

**Total Non-Submitted: 23,518**

**Total Collected: 46,705**

**2016 Combined Data:**

Total Pools Tested: 604

Total Mosquitoes Tested: 15,877

Total Non-Submitted: 20,699

Total Collected: 35,576

**West Nile virus isolations 2017: 15 pools**

- **35% below 10-year average, 40% below 5-year average**
- **11 pools of *Cx. pipiens/restuans* complex collected from gravid traps**
- **1 pool of *Oc. canadensis* and 3 pools of *Cs. melanura* collected from CDC light traps**



- **1 human case of West Nile reported by MA DPH, not near trap sites.**

Table 1- Towns and number of West Nile virus positive pools in 2017.

<b>Town</b>	<b>WNV+ pools</b>
Dartmouth	1
Dighton	1
Fairhaven	1
Freetown	1
Norton	2
Rehoboth	4
Seekonk	3
Swansea	2
<b>Grand Total</b>	<b>15</b>

- WNV 2016: 8 pools
  - 7 pools of *Cx. pipiens/restuans* complex
  - 1 pool of *Oc. japonicus*
  - All WNV positive mosquitoes were collected from gravid traps.
- WNV 2015: 14 Pools
  - 12 pools of *Cx. pipiens/restuans* complex
  - 1 pool of *Cs. melanura*
  - 1 pool of *Cx. salinarius*
- WNV 2014: 8 Pools
  - 6 pools of *Cx. pipiens/restuans* complex
  - 2 pools of *Cs. melanura*
  - Most WNV positive mosquitoes were collected from gravid traps.

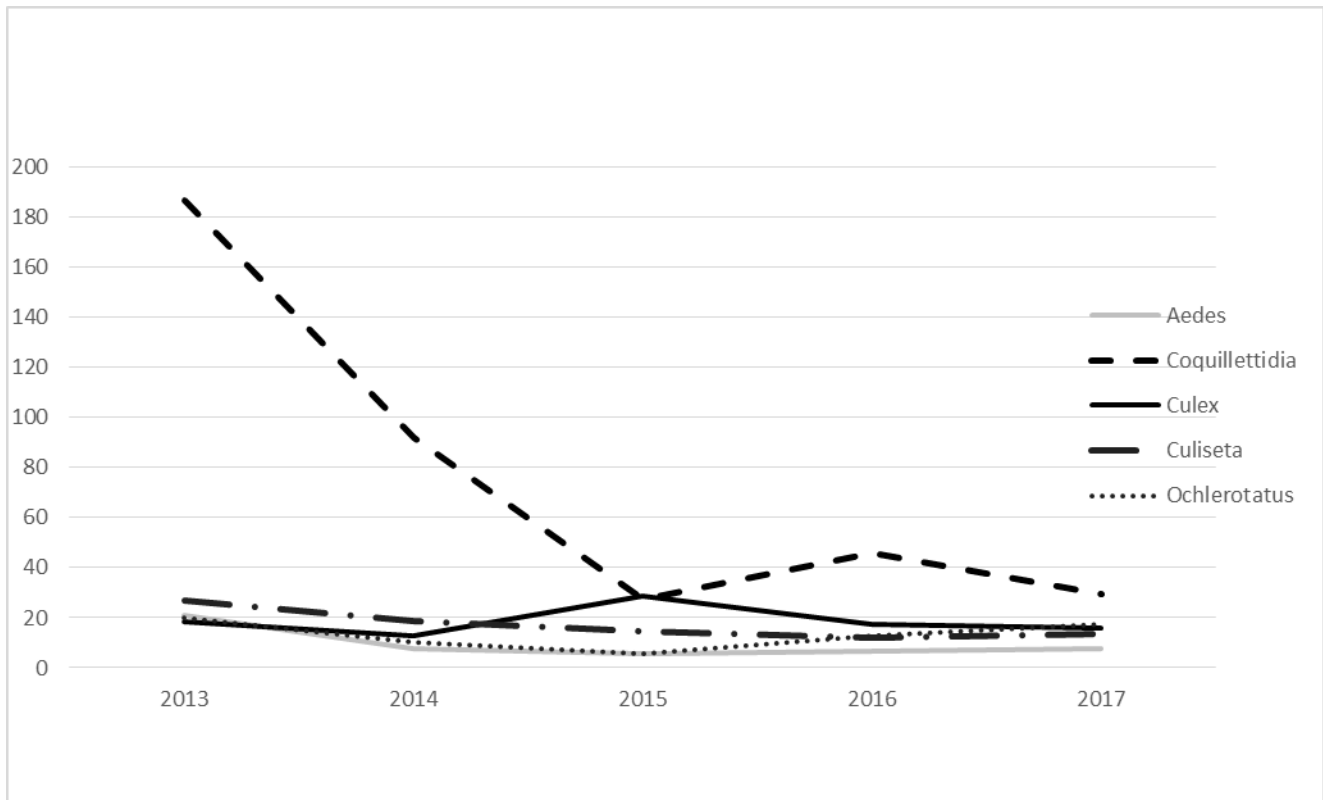
## EEE virus isolations 2017: 1 pool

- 95% below 10-year average, 89% below 5-year average
- 1 pool of *Cs. melanura* collected from Westport resting boxes by MA DPH, finding not repeated
- EEE 2016: 0 pools
- EEE 2015: 0 pools
- EEE 2014: 15 Pools
  - 14 pools of *Cs. melanura*
  - 1 pool of *Cx. pipiens/restuans* complex
  - Most EEE positive mosquitoes were collected from CO<sub>2</sub>-baited traps and resting boxes.
- EEE 2013: 29 Pools
- EEE 2012: 100 Pools (highest year for EEEv)

## Mosquito activity/trends for the 2017 Season

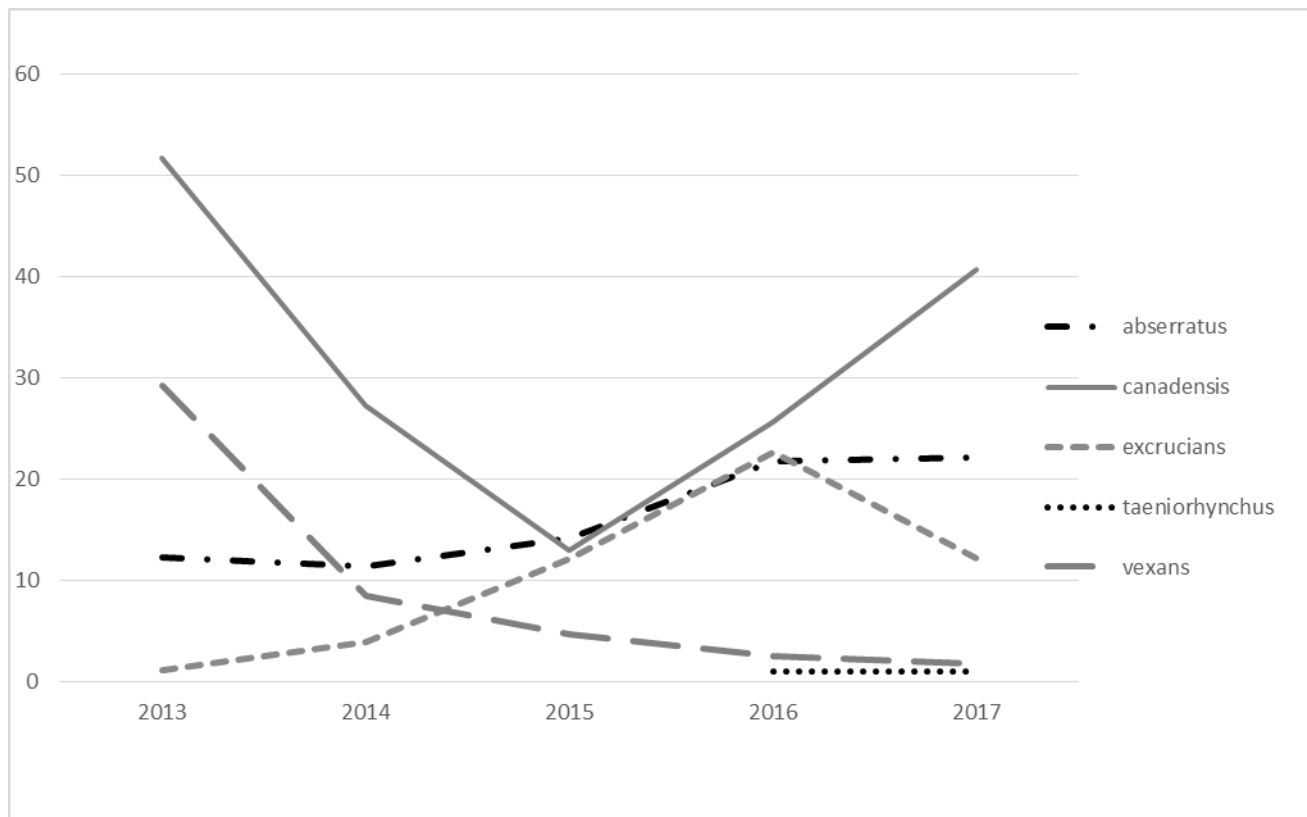
The winter of 2016-17 was relatively warm and dry, with 11 to 15% less snowfall than an average Bristol County year and 60% less than the record-breaking accumulation of 2014-15. Bristol County started its season in a drought condition, which has been consistent for the past 4 years. Wet spring weather brought us out of severe drought by June 2017, only to return to moderate drought by August. Total mosquito populations were up 34% from 2016 and 26% from the 10-year average. Despite the population increase, spray requests fell by 8.2% from 2015 levels.

After a mild winter with little snowfall, larvicide crews reported dry conditions in known spring breeding grounds. Increased spring rains coming between the ends of the larvicide and beginning of the spray seasons boosted late-spring populations. As a result, the early spring species *Oc. excrucians* was down about 38%, but later spring species *Oc. abserratus* and *Oc. canadensis* rose 120% and ~700% respectively.



**Figure 1-** Mean number of observed mosquitoes by genus captured per trap-night by BCMCP and MA DPH in Bristol County, MA 2013 to 2017.

Figure 1 shows five-year population trends at the genus level, averaged for each trap-night to minimize trapping effort effects. Most genera show population decrease since 2013.



**Figure 2-** Mean number of top 5 observed *Aedes/Ochlerotatus* mosquitoes captured per trap-night by BCMCP and MA DPH in Bristol County, MA 2013 to 2017.

Figure 2 shows changes in the mean composition of the top 5 *Aedes/Ochlerotatus* species per trap-night. *Oc. canadensis* continues to recover from a very dry 2015, as our permanent water habitat refills and retains more water. Increases in the number of *Oc. taeniorhynchus* between 2015 and 2016-17 might best be explained by minor changes in trapping schedule or species ID methods.

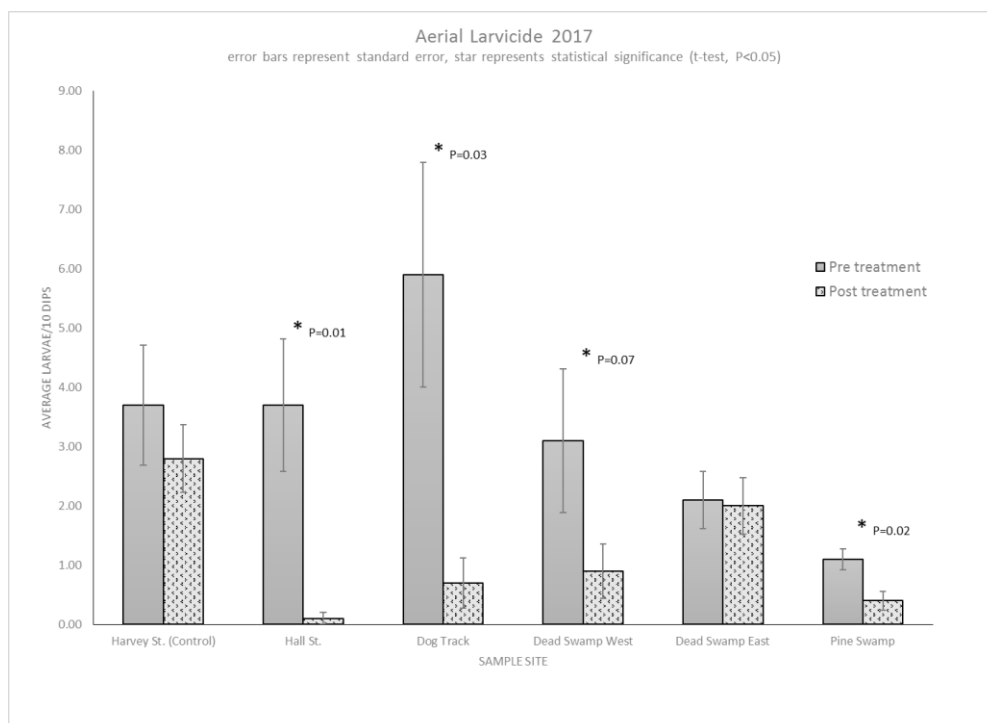
### **Aerial larvicide, spring 2017**

BCMCP and Plymouth County MCP conducted another joint aerial larvicide operation in the Hockomock Swamp area in spring 2017. For Bristol County, this represented a treatment of our half of the Hockomock Swamp (~2500 acres) in the towns of Easton, Raynham and Taunton; the Pine Swamp (~440 acres) in Taunton; and the Dead Swamp (~180 acres) in Raynham. In these swamps, 3,120 acres were treated with VectoBac 12AS by Plymouth MCP's aircraft. Pre- and post-treatment

larval surveillance was conducted at 6 sites (5 treated, 1 control). Significant reductions in larval populations were observed at 4 of 5 treatment sites (Table 2; Figure 3).

**Table 2-** Aerial larvicide test results 2017. Both Abbot's and Henderson-Tilton formulae show significant population decline in all sites except Dead Swamp East. Results match t-test results.

Location	Test type		
	Abbot's	Henderson-Tilton	t-test (P<0.05)
Harvey St. (Control)	0.00	0.00	0.52
Hall St.	96.43	96.43	0.01
Dog Track	75.00	84.32	0.03
Dead Swamp West	67.86	61.64	0.07
Dead Swamp East	28.57	-25.85	0.91
Pine Swamp	85.71	51.95	0.02

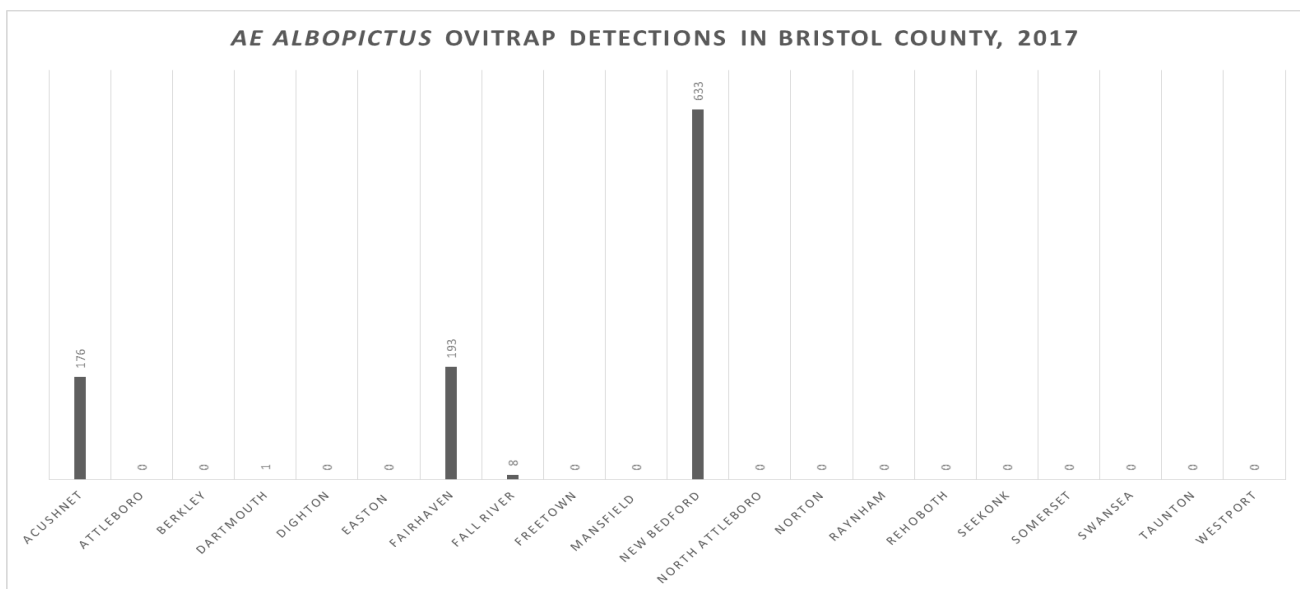


**Figure 3-** Pre- and post-treatment larval populations in the Hockomock, Pine and Dead Swamps, April-May 2017. Error bars represent standard error, asterisks denote statistical significance (t-test, P<0.05).

## Asian tiger mosquito (ATM) surveillance and treatment

Bristol County MCP continued monitoring the most southern towns in our region for the invasive Asian tiger mosquito, *Ae. albopictus*. This effort was expanded in 2016 through a combined effort between BCMCP and the MA Department of Public Health. The surveillance plan contained three parts: ovitrap cups placed throughout the region to determine presence/absence, BG Sentinel™ traps used as a follow-up where presence of eggs were detected, and BG Sentinel™ traps to monitor areas with historical population data. Traps in Bristol County were set by both BCMCP and MA DPH.

Continuing from 2016, ovitrap papers from all Massachusetts MCPs were collected and sent to MA DPH's Hinton State Lab for raising under controlled conditions in the lab's insectary. Ovitrap papers are attractive egg deposition sites not only for *Ae. albopictus*, but *Ae. japonicus* and *Ae. triseriatus* as well. Therefore it takes a bit of time for eggs to hatch and mosquito identification to occur. Reports from DPH of *Ae. albopictus* presence/absence are commonly delayed, as the techniques used in that lab have yet to be refined.

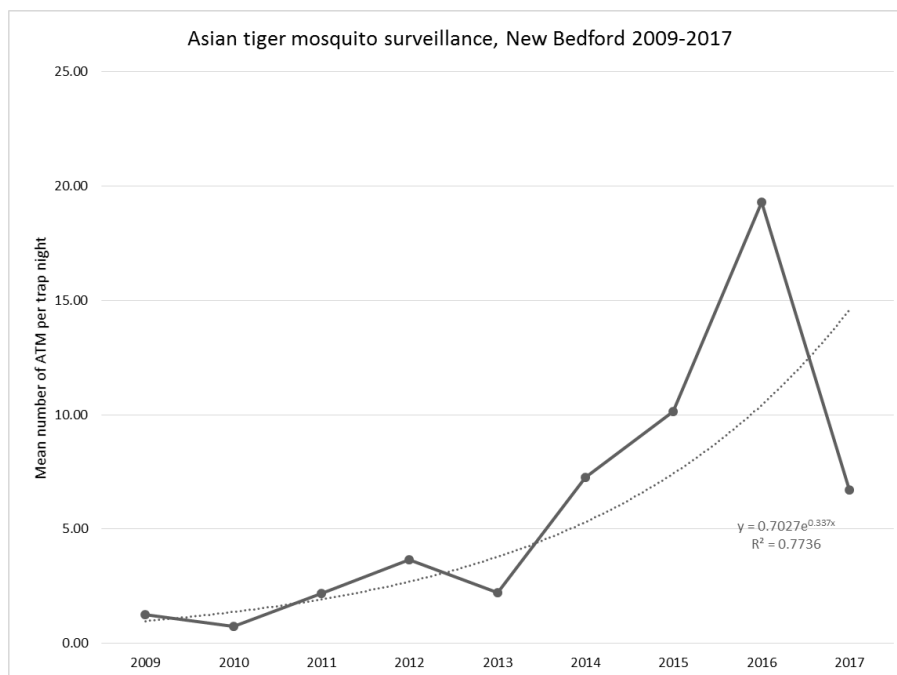


**Figure 4-** Location and number of 2017 ovitrap detections of Asian tiger mosquitoes in Bristol County.

BCMCP and MA DPH set 415 ovitraps over 20 weeks across the South Coast of potential *Ae.*

*albopictus* habitat. 107 papers from sites with presence of mosquito eggs were sent to the MA DPH insectary; of these, 43 had viable *albopictus* eggs. Figure 4 shows ovitrap detections of viable *Ae. albopictus* eggs collected by BCMCP and hatched in the MA DPH insectary. New detections in Fairhaven, Fall River and Acushnet were recorded. Of all detections, the Fall River and Dartmouth detections did not recur after the first detection. All detections of viable eggs from ovitraps were followed up with BG Sentinel™ trap efforts, often without finding adults.

Routine BG trap surveillance in New Bedford points to an established and increasing population along the waterfront area and around Acushnet Avenue. The data shown in Figure 5 has been averaged by trap-night to correct for the increased trapping effort that BCMCP has undertaken. The dotted line in Figure 4 shows an  $R^2$  value of 0.776, indicating exponential correlation (an  $R^2$  value of 0.1 represents a low correlation, while a value of 1.0 is a perfect correlation). This correlation has decreased from last year's  $R^2$  of 0.889



**Figure 5-** Population increase for Asian tiger mosquitoes in all traps in New Bedford, 2009-2017. Data normalized to decrease effects of increased trap effort. Dotted trendline represents exponential growth curve.

BCMCP held meetings with the Board of Health in New Bedford over the past year. While no conclusive control plan has yet been reached, the level of engagement remains high. This year, a

pesticide treatment was conducted at the two major infestations, the tire facilities on Washburn Street and Acushnet Avenue. A 65% overall reduction in *Ae. albopictus* populations was observed, there will be a more detailed analysis in a forthcoming report.

## **Virus Interventions**

The first reported activity for the 2017 season occurred in Fairhaven where mosquitoes tested positive for WNV in early July (Epi-week 27). During Epi-week 28 (July 15), neighboring Rhode Island reported EEEv in mosquitoes along our western border. In response, BCMCP increased trapping efforts in towns adjacent to that state. Additional truck-based ULV applications along the border towns were ramped up for the following few weeks. No further evidence of EEEv infected mosquitoes were detected from the RI site or our towns along the border until a much later date.

EEEv in Bristol County was detected in one sample of *Cs. melanura* collected by MA DPH in mid-August from a resting box site in Westport. This was the only detection in the state for EEE in 2017. Overall *Cs. melanura* populations were low at the beginning of the season but increased during the mild and wetter August/September period. The EEEv positive site was treated with a small-scale (1/2 mile radius) ULV application and additional focus on residential request. No nighttime interventions were conducted.

Activity for WNV switched to the western side of the County with detections in Seekonk and Swansea in early August (Epi-week 31). These sites were treated with large-scale (2-3 mile radius) truck-based ULV pesticide applications. This pattern followed for additional detections during the following six-week when WNV was identified from Norton, Dighton, Rehoboth, Seekonk and Swansea. WNV remained active in these towns with new collections from Dartmouth and Freetown in Epi-week 37. *Cx. pipiens/restuans* was again the most common carrier for WNV, with the exception of three pools of *Cs. melanura* and one pool of *Oc. canadensis* in Rehoboth.

At the end of the 2017 surveillance season, all 20 cities and towns in Bristol County are reported by MA DPH to be in the Low Risk category for EEEv. For WNV, the cities and towns of Acushnet, Attleboro, Dartmouth, Dighton, Fairhaven, New Bedford, Norton, Rehoboth, Seekonk,



Swansea, and Taunton are reported at moderate risk; all other towns in Bristol County remain at low risk.

### **Requests for service**

Bristol County MCP received 11,150 calls for service in 2017, a decrease of 8.23% from 2016 and -17% from the 5-year average. BCMCP stopped taking residential requests as of 8/25/17. In the past 5 years, Bristol has received 15,792 calls for service in 2013, 12,971 in 2014, 15,133 in 2015 and 12,237 calls in 2016.

### **Bristol County Mosquito Control Project's Outreach:**

Public outreach is an important part of our program. Educating people on how they can protect themselves and reduce mosquito breeding on their property is an effective, proactive step to combat virus transmission. We participated in a variety of public outreach projects including radio, newspaper, and television interviews. 2017 started with a Science Fair in Taunton in January, televised Mosquito and Arbovirus Discussions in Seekonk and Attleboro, a STEM Career Day at Seekonk High School, several Information and Customer Service Booths in Attleboro and New Bedford and our annual appearance at the Capron Park Zoo.

Coordination between BCMCP and the local Boards of Health was ongoing relative to control/surveillance options in the vicinity of WNV positive mosquito pools and high mosquito collections. Even though Labor Day is the unofficial end of summer, BCMCP continues to alert the public that the seasonality of WNV continues until the first frost in fall. Bristol County had 1 late-season human case of WNV; other Massachusetts counties have been very active with the virus. In response, we released several public reminders that the majority of WNV cases occur in September and early October. Educational materials have been provided to public and private entities as well as local Boards of Health. Twitter was used extensively to make the public aware of upcoming activities and public health notices. Bristol County has an updated website at a new address:

<http://www.mass.gov/eea/bristolcountymosquitocontrol>

Prepared by Todd B Duval, Entomologist

Timestamp			District/Project Name	Town/City	Sections Completed:	Control Actions:	Reason for Control	Comments:
7/14/2017 13:22			Bristol County	Fairhaven	West	Catch Basin Treatment, Ground ULV Treatment, Public Outreach (including social media)	WNV Positive Pool	At the request of the Fairhaven Board of Health, a large scale application was made in the area around the trap site on Wednesday 7/12/17
8/11/2017 12:25			Bristol County	Swansea	North	Ground ULV Treatment, Public Outreach (including social media)	WNV Positive Pool	Made an application around the trap that tested positive for WNV
8/11/2017 12:27			Bristol County	Seekonk	West	Ground ULV Treatment, Public Outreach (including social media)	WNV Positive Pool	Made an application around the trap that tested positive for WNV
8/11/2017 12:33			Bristol County	Fall River	Southwest	Ground ULV Treatment, Inspection, Public Outreach (including social media), Supplemental Trapping, larviciding and cleaning of property	Ae. albopictus detection	A detection of 1 Ae. albopictus reared from MDPH's ovicups resulted in a multi-prong response. Fall River Department of Health sent out a press release regarding the findings and that a multiple block area would be sprayed on Friday 8/11/17. Additional traps and inspection of the property and area was conducted. No adults were collected. Larvicide was applied to areas around the property holding water.
8/29/2017 7:42			Bristol County	Norton	East	Ground ULV Treatment, Public Outreach (including social media), Supplemental Trapping	WNV Positive Pool	Increased surveillance for human biting mosquitoes at the trap site. Conducted a very limited ULV application to the trap site which is an Emu Farm. Norton BOH put a press release in the local paper after speaking with us.
8/29/2017 7:44			Bristol County	Seekonk	Southeast	Catch Basin Treatment, Ground ULV Treatment, Public Outreach (including social media), Supplemental Trapping	WNV Positive Pool	Due to the continuation of WNV from this site, BCMCP increased efforts in this area.

**District Name: Bristol County Mosquito Control Project**

FY2018 Proposed Cherry Sheet Assessments Estimates

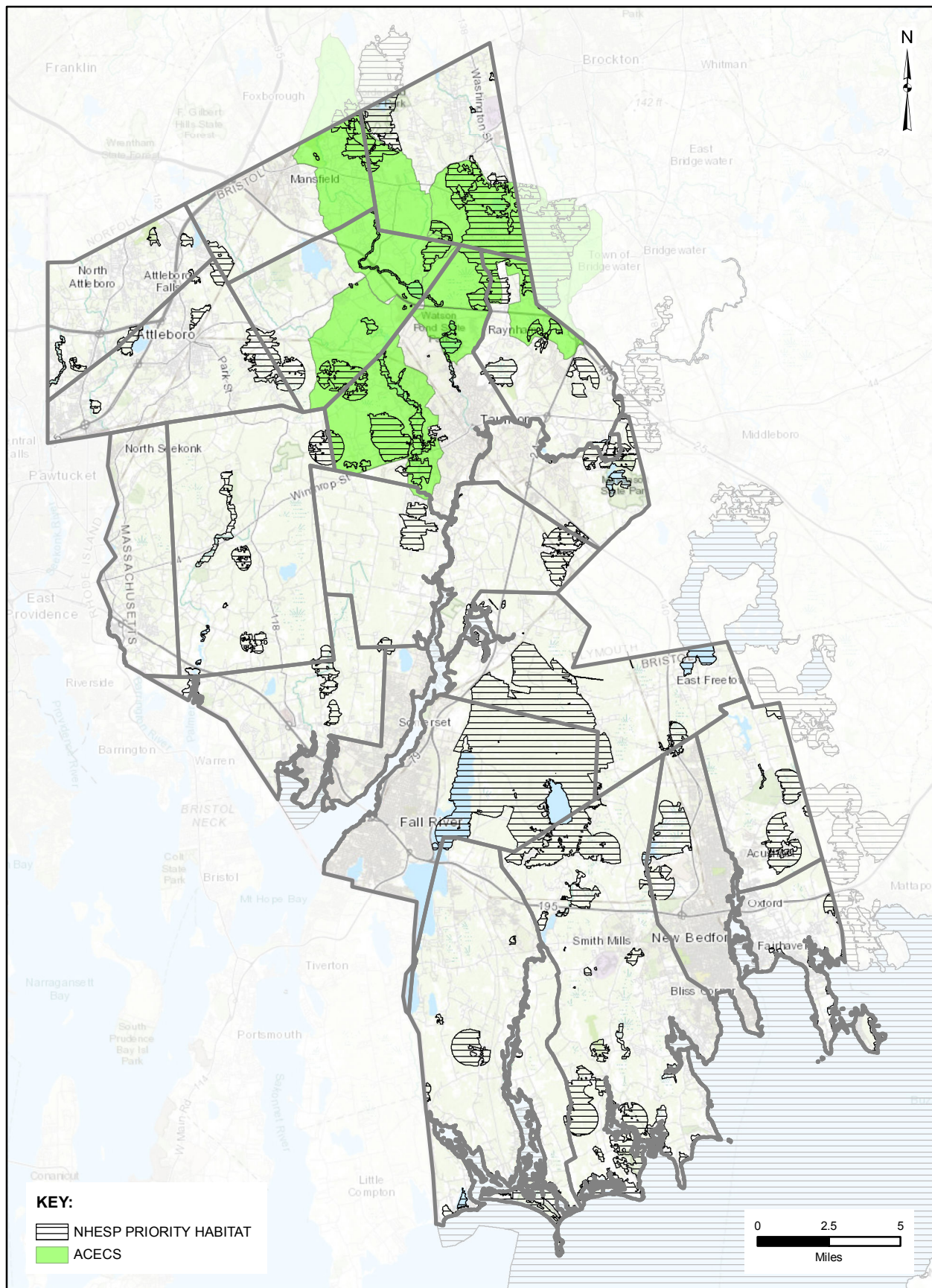
Based on the preliminary proposed District budget

(2017 Equalized Valuations)

<b>Name of Municipality</b>	<b>% of Total Budget</b>	<b>District Share Amount*</b>	<b>State Reclamation Mosquito Control Board Share Amount*</b>	<b>Total Assessment Estimate*</b>
ACUSHNET	2.61%	\$37,024	\$1,528	\$38,552
ATTLEBORO	6.05%	\$87,213	\$3,598	\$90,811
BERKLEY	2.18%	\$30,519	\$1,259	\$31,778
DARTMOUTH	10.11%	\$145,269	\$5,994	\$151,263
DIGHTON	2.79%	\$39,434	\$1,627	\$41,061
EASTON	5.26%	\$77,156	\$3,183	\$80,339
FAIRHAVEN	2.87%	\$40,419	\$1,668	\$42,087
FALL RIVER	7.73%	\$105,807	\$4,366	\$110,173
FREETOWN	4.36%	\$62,309	\$2,571	\$64,880
MANSFIELD	4.73%	\$69,127	\$2,852	\$71,979
NEW BEDFORD	6.84%	\$94,323	\$3,892	\$98,215
NORTH ATTLEBORO	4.83%	\$70,599	\$2,913	\$73,512
NORTON	4.49%	\$63,374	\$2,615	\$65,989
RAYNHAM	3.50%	\$50,713	\$2,092	\$52,805
REHOBOTH	5.63%	\$80,740	\$3,331	\$84,071
SEEKONK	3.48%	\$50,744	\$2,094	\$52,838
SOMERSET	3.04%	\$36,110	\$1,490	\$37,600
SWANSEA	3.79%	\$55,251	\$2,280	\$57,531
TAUNTON	8.49%	\$118,325	\$4,882	\$123,207
WESTPORT	7.22%	\$102,279	\$4,220	\$106,499
		\$1,416,735.00	\$58,455.00	\$1,475,190

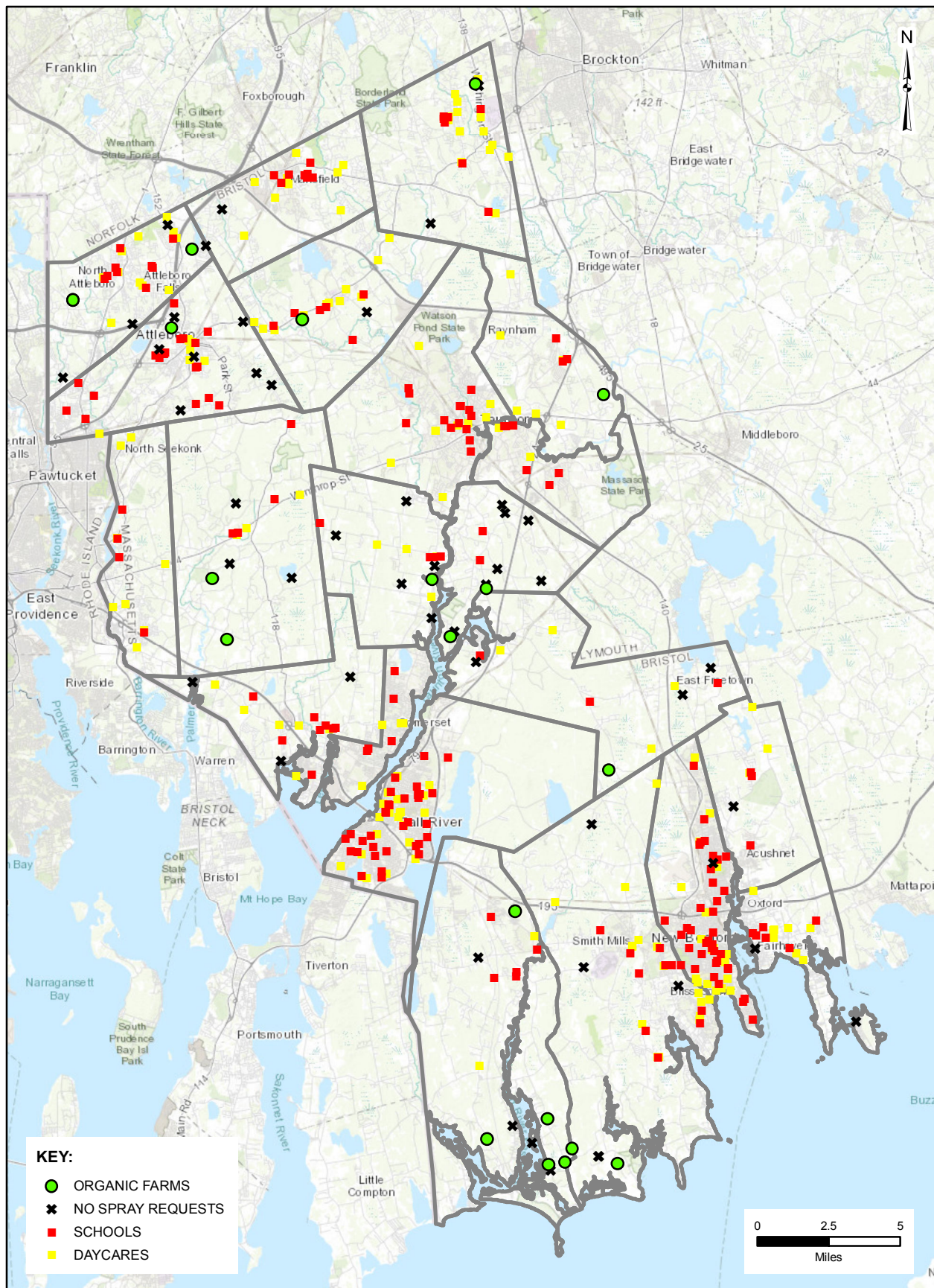
\*Assessment estimates are preliminary and will only be finalized after the State Reclamation & Mosquito Control Board budget certification meeting held annually in May/June.

Figure 5



**Figure 6. Exclusion Areas**





**Figure 7. No Sprays**