MASSACHUSETTS MOSQUITO CONTROL

ANNUAL OPERATIONS REPORT

Year Report Covers: 2019 Date of Report: 1/24/2020

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

Address: 38R Forest Street

City/Town: Attleboro Zip: 02703

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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.

ORGANIZATION SETUP:

Commissioner names:

Robert Davis
Joseph Barile
Gregory Dorrance
Christine Fagan

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, Aaron Toth, Todd Duval
☒ Information technology Diana Brennan, Priscilla Matton
☒ Laboratory Todd Duval
☒ Operations Priscilla Matton, John Moniz, Drew Bushee, John Pereira, Matthew Gavaza, Larry Goss, Anthony Souza, Joshua Nickerson, Aaron Toth, Todd Duval, Diana Brennan
☒ Public relations Priscilla Matton, Todd Duval
☒ Wetland scientist Diana Brennan
☒ Other (please describe) Seasonal Mosquito Surveillance Technician- Amanda Cadieux, Seasonal Office Assitant- Theresa Beale

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

3 Modified wetland equipment (list type) Low- ground pressure excavators
2 Larval control equipment (list type) Backpack Sprayers
10 ULV sprayers (list type) 4 London Fog (GPS), 3 Guardian (GPS), 1 Curtis DynaJet (GPS), 1 Beecomist, 1 London Air
11 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 larvidicing 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 artifical 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	☐ Catch basins ☐ Containers ☒ Wetland ☐ Other (please list):	3,882 lbs
VectoLex WSP	73049-20	1 per 50 sq. ft.	Hand	Larvae	☒ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	410 lbs
VectoMax WSP	73049-429	1 per 50 sq. ft.	Hand	Larvae	☒ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	223 lbs
VectoBac 12AS	73049-38	1 pint per acre	Aerial	Larvae	☐ Catch basins ☐ Containers ☒ Wetland ☐ Other (please list):	379 gallons
Altosid XR Briquets	2724-421	1 per 100 sq. ft.	Hand	Larvae	☐ Catch basins ☒ Containers ☐ Wetland ☐ Other (please list):	0.48 lbs
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	

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
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	
				Choose one	☐ Catch basins ☐ Containers ☐ Wetland ☐ 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 2019. Approximately 3,028 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 & 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 2019 season, Bristol County had one human cases of WNV. In 2019, three human cases of EEE were reported, all resulting in fatalities. There were no human cases in Bristol County in 2013 through 2018 for EEE.

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: _____

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**
Duet	1021-1795-8329	0.64 oz/acres	Truck mounted ULV	1,123 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:
2019 brought the first dedicated tire removal program to BCMCP. This program addresses source reduction via removal and disposal as BCMCP work crews find tires, containers and other articles that would serve as larval habitat. This tire program is limited to tires that BCMCP crews find in the course of their water management work and is not open to the public. 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: _____

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. We also maintain previously excavated ditches. 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)
☒ Culvert cleaning	
☒ Hand cleaning	74,610 ft
☒ Mechanized cleaning	9,590 ft
☒ Stream flow improvement	
☒ Other (please list): Reclaim	74,610 ft

Comments: Culvert cleaning and stream flow improvement cumulative length are included in mechanized and hand cleaning. Cumulative mechanized brush mowing 20.06 acres (24,550 linear feet).

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

Maintenance Type	Estimate of cumulative length of ditches maintained (ft)
☒ Hand cleaning	3,845 ft
☒ Mechanized cleaning	1,045 ft
☒ Other (please list): Reclaim	3,845 ft

Comments: Cumulative mechanized brush mowing 0.50 acres (605 linear feet).

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

Comments: Monitored 42,721 ft of previously maintained ditches to confirm site stabilization and work efficacy. Completed 26 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 and easier passage for small fish which eat mosquito larvae present in the marsh habitat easier. This can reduces 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 relavent 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 mangement sites multiple times per season to check for blockages or debris that may obstruct the flow of water and to meet any additonal requirements in the BMP. In areas where containers or tires were removed, some sites are re-checked during the season.

Other (please list): Pesticide efficacy testing was completed for each of the thrree aerial adulticide events in August and September 2019.

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. Efficacy testing for ULV pesticides is performed using CDC Bottle Bioassay methods and results are reported internally and to CDC.

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

Research Project	Details
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 and adult surveillance
Other: Aerial larvicide	Pre- and post treatment larval surveillance

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 used this past season by your program:

Trap Type	**Canopy?** (check box for yes)	**Number of traps** (leave blank if zero)
☐ ABC light trap	☐	
☐ ABC light trap w/CO_2	☐	
☒ CDC light trap	☐	variable
☒ CDC light trap w/CO_2	☐	14 per week
☒ Gravid trap		64 per week
☒ Landing rate test		2 locations
☐ NJ light trap	☐	
☐ NJ light trap w/CO_2	☐	
☒ Ovitrap		48 per week
☒ Resting box		30 per week
☒ Other (please describe): BG Sentinel traps		4 per week
☒ Other (please describe): GAT traps		3 per week
☐ Other (please describe):		

Do you maintain long-term trap sites in any of your areas? Yes
If yes, how many:
23

Please check off the species of concern in your service area:
☒ *Ae. albopictus* ☐ *Ae. cinereus*

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

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

Number of adult mosquitoes collected this season (whether submitted to DPH or not): 127,007
Number of adult mosquito pools collected this season (submitted and unsubmitted): 4,375
Number of ovitrap collections this season, if any: 153
Any other trap collections of note (please describe): 105 BG Sentinel traps

Do you participate in the MDPH Arboviral Surveillance program? Yes
Total number of adult mosquito pools submitted to DPH this past season: 524
How many pools do you submit weekly on average? 22.5

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**
☒ Eastern Equine Encephalitis (EEE)	158	0	3
☒ West Nile Virus (WNV)	14	0	1
☐ Other (please list):			

Comments: West Nile virus detections were 47% lower than 10-year average, 39% lower than 5-year average. EEE virus detections 491% higher than 10-year averag, 497% higher than 5-year average.

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	6 Critical, 6 High, 8 Moderate
WNV	Low	Moderate- All towns

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, school, library, 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. Spring Show with Bristol County Agricultural High School, May
2. Party for the Planet, Buttonwood Zoo, April
3. Employee Health Fair, Amazon Fulfillment Warehouse, September

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 Agricutural High School 's Natural Resource Management Advisory Board and the Taunton High School's Science Curriculum working group. Todd participated in a STEM program and student group discussion at Seekonk High School. Priscilla presented in a STEM program for the Somerset-Berkley Regional School district, which was taped and replayed on school TV. Todd Duval was co-author of a scientific note in the Journal of the American Mosquito Control Association regarding the detection of Ae. thibaulti

in Massachusetts. BCMCP has also begun working with the Northeast Regional Center for Excellence in Vector Borne Diseases at Cornell University on pesticide efficacy and Cs. melanura control efforts. Priscilla presented at the Northeast Regional Center for Excellence in Vector Borne Diseases' Boot Camp on "Vector control for mosquitoes".

☒ Another mosquito control district/project Continuation of Cs. melanura surveillance and control in conjuction with Plymouth Co. MCP. Provided mosquito teaching collections and ongoing support for Ae. albopictus programs at other MCDs. At the invitation of Cape Cod MCP, Diana participated in an end-user meeting for the marsh sustainability and hydrology decision support tool being developed by the Woods Hole Oceanographic Institution (WHOI). Todd Duval helped teach a mosquito ID workshop at Cape Cod Community College as part of the NMCA Mosquito Madness event in May.

☒ Another state agency (DCR, DPH, etc.) Steady cooperation with DPH on Ae. albopictus concerns, including meeting with local town officals in Bristol County. Coordination with MassDOT on water management projects which incorporate state road drainage ditches.

☒ Environmental groups Fairhaven Acushnet Land Preservation Trust (FALPT) and Dartmouth Natural Resources Trust (DNRT) on water management projects. Diana is a member of the Buzzards Bay Coalition (BBC) Restoration Advisory Committee. BCMCP is partnering with BBC, Woods Hole Research Center (WHRC), Save the Bay (STB), Buzzards Bay National Estuary Program (BBNEP), and the U.S. Geological Survey (USGS) on a SNEP Watershed Grant Salt Marsh Resilience Project.
☐ Industry

List any training/education your staff received this year: AMCA Annual meeting, NMCA Annual Meeting, NMCA Field Day, Clarke training and continuing education for those with MA Hoisting License. "Right to Know" and tick education was provided. Multiple state required training through PACE. HR training workshop. Entomologist Todd Duval particpated in the CDC/NACCHO Vector Summit and attended the regional EEE conference.

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, Red Cross CPR certification
Joshua Nickerson: Licensed MA Pesticide Applicator, CDL license, Hoisting license
Matthew Gavaza: Licensed MA Pesticide Certification (47), Hoisting license
Anthony Souza: Licensed MA Pesticide Certification (47)
Larry Goss: Licensed MA Pesticide Certification (47)
John Pereira: Licensed MA Pesticide Applicator
Aaron Toth: Licensed MA Pesticide Applicator

Diana Brennan: B.S. Environmental Science and Management, Licensed MA Pesticide Certification (47)

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:

Describe any difficulties your program had with IT software/equipment this year:

Comments: No updates were made in 2019.

REVENUES & EXPENDITURES

Please enter your approved budgets for the current, previous, and future fiscal years.

	Date of Fiscal Year	**Approved Budget**	**Notes**
Previous	FY 18	$1,416,734.00	
Current	FY 19	$1,473,403.00	
Future	FY 20	$1,532,339.00	estimated

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 19 Cherry Sheet Assessment, figure 5

Comments: _____

SERVICE REQUESTS

How many service requests did you receive this season? 12,666
How many were for larviciding? 123
How many were for adulticiding? 12,543

Was this an increase or decrease over last season? Increase

Comments: This year we saw a 20% increase in adult spray requests compared to 2018. However, spray request may not represent actual number of properties treated. Often entire neighborhoods of 20-75 households will be recorded as a single request with directions for the applicator. BCMCP is representing larvicide request as new to the Project and not currently on our historical larvicide maps.

EXCLUSIONS

How many exclusion requests did you receive this season? 107

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 continued inspections and work on a source reduction plan with 2 separate tire facilities and an abandoned lot located in New Bedford where the invasive Ae. albopcitus 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 and respond to requests from 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 and responded to requests from 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. Significant coordination with the City of Taunton occurred during 2019 to resolve complex drainage and mosquito breeding concerns within the city. Coordinate with the New Bedford Airport on water management projects.

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

  Describe: Working with local airports on long term ditch maintenance and vegetation plans. 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. Work with partners and landowners (DNRT, FALPT, BBC, etc.) to evaluate long-term solutions to salt marsh ditch maintenance in a rapidly changing ecosystem.

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

  Describe: BCMCP conducted cooperative research with Mass MCPs on Ae. albopictus surveillance. Worked with partners (DNRT, FALPT, BBC, STB) to plan and/or execute salt marsh restoration/ditch maintenance projects and salt marsh resilience research projects.

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

  Describe: NMCA, NMCA Field Day, NMCA annual meeting, Regional EEE meeting. Attended NACCHO Vector Summit. Attended BBC Restoration Advisory Committee meetings. Attended end-user meeting for WHOI's marsh sustainability and hydrology decision support tool. Attended project team meetings for the SNEP Salt Marsh Resilience Project. Attended site meetings with MassDOT, City of Taunton, and salt marsh project partners. Partcipated 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 complaince rates for IPM development and submissions has not been updated.

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: _____

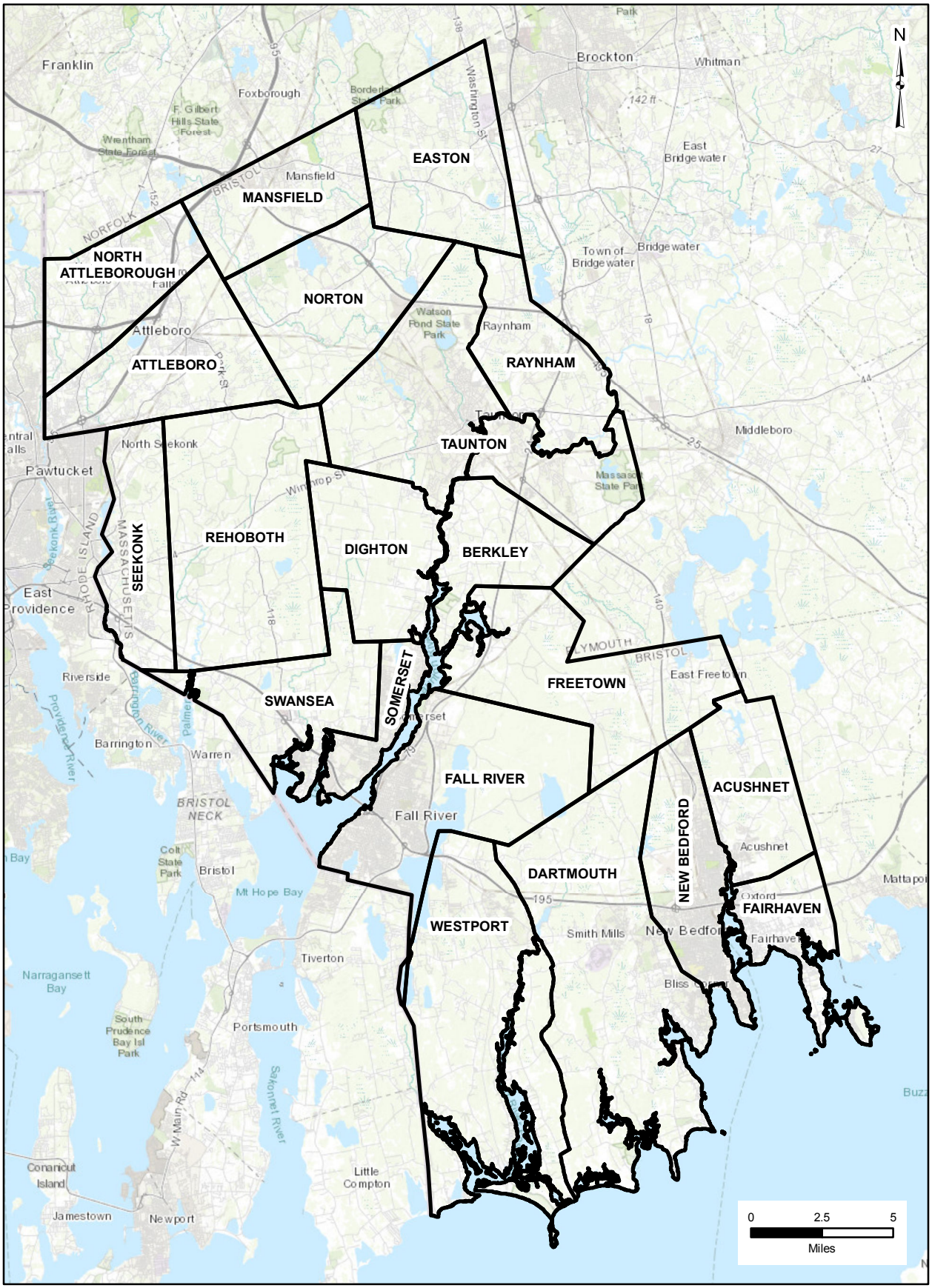

Figure 1. Bristol County

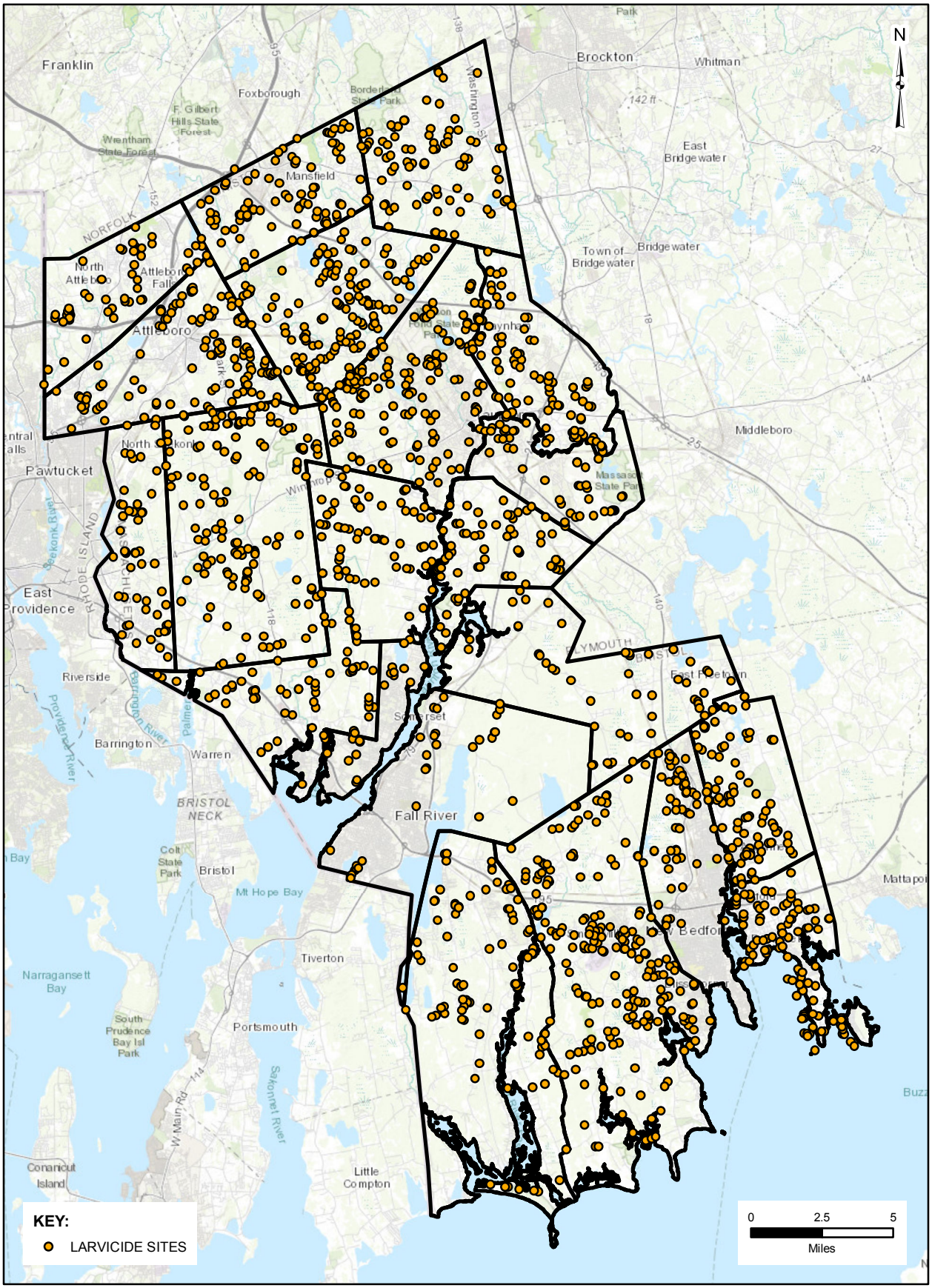

Figure 2. 2019 Larvicide Sites

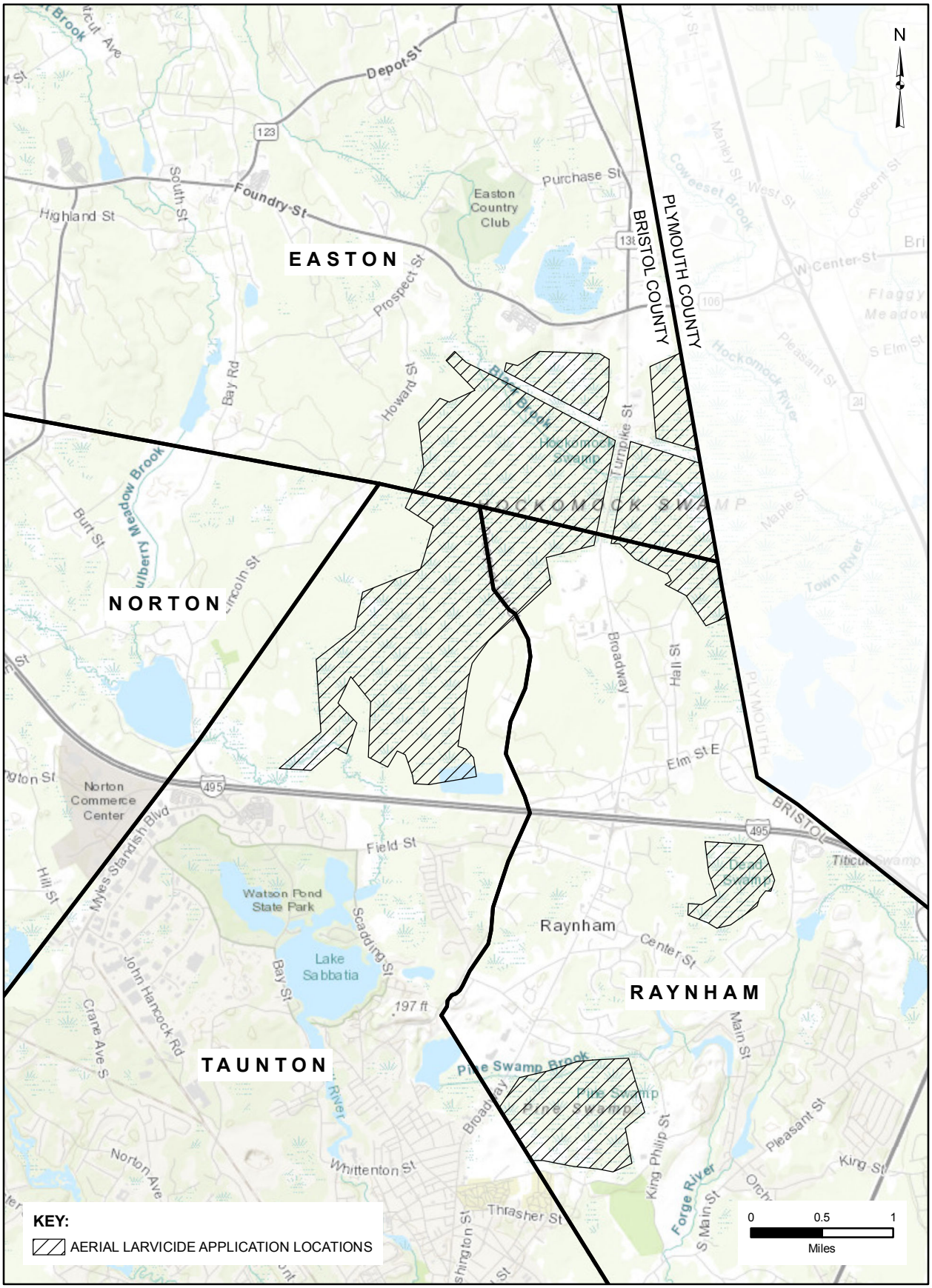

Figure 3. Aerial Larvicide Application Locations within Bristol County

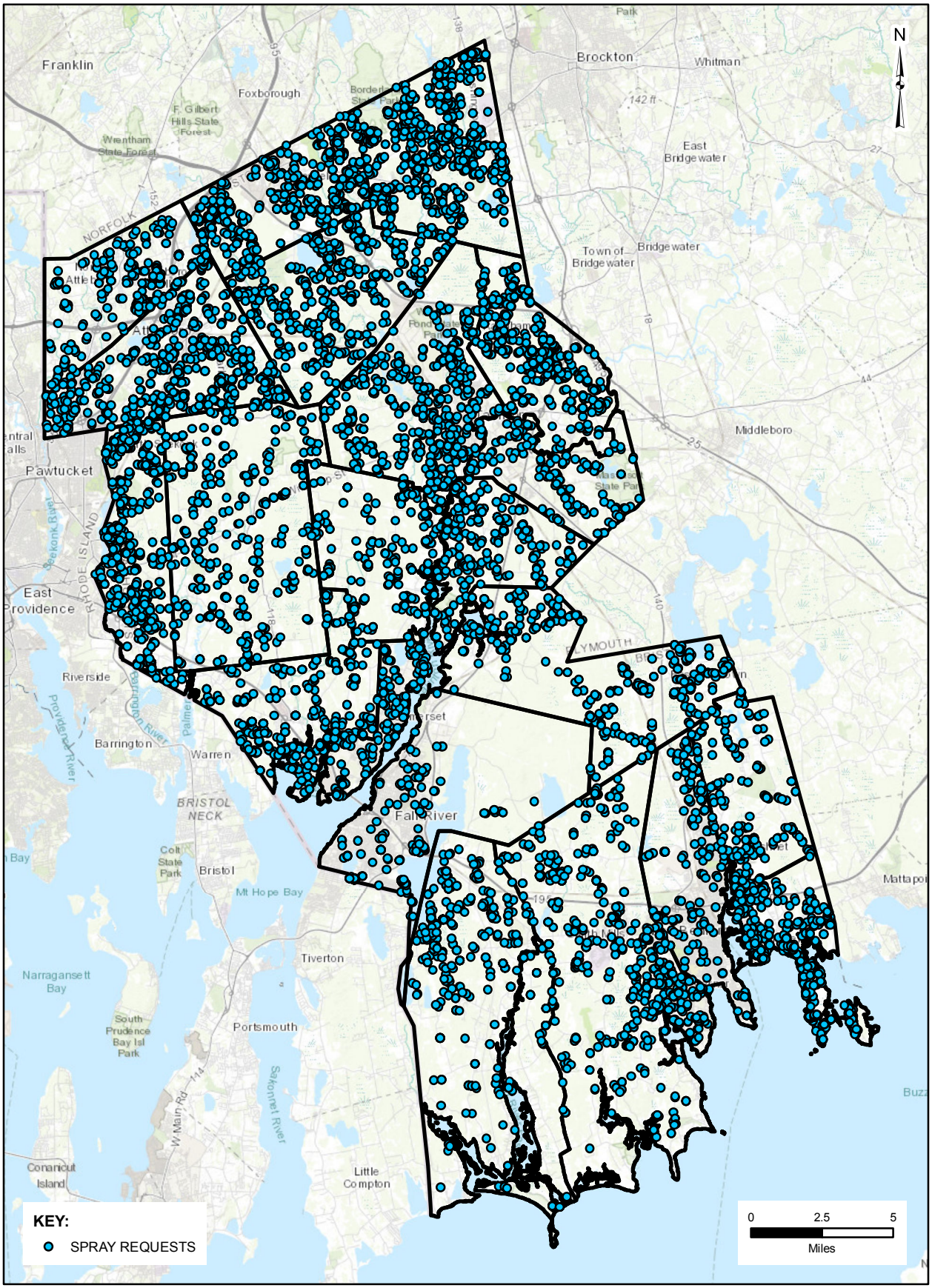

Figure 4. 2019 Spray Requests

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
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CHRISTINE A. FAGAN
JOSEPH BARILE

SUPERINTENDENT
PRISCILLA MATTON, MS

Wednesday, January 15, 2020

Bristol County Mosquito Control Project (BCMCP)

End of the 2019 Season Report

This report is based on data collected from CO_2-baited CDC traps, resting boxes, gravid traps, ovitraps and BG Sentinel™ Traps.

- **Total Samples Submitted for Testing 2019: 1,060**
  - + 22.5% change from 2018
  - Total Samples Submitted for Testing 2018: 865
- **Total Samples Submitted from Bristol Co. by MA DPH in 2019: 536**
  - + 50.1% change from 2018
  - Total Samples Submitted for Testing 2018: 357
- **Total Samples Submitted from Bristol Co. MCP in 2019: 524**
  - +3.1% change from 2018
  - Total Samples Submitted for Testing 2018: 508
- **Total Number of Mosquitoes Tested from Bristol Co. in 2019: 35,713**
  - + 32.5% change from 2018

- Total Number of Mosquitoes Tested in 2018: 26,960
- Total Number of Mosquitoes Tested in 2017: 22,280

- **Total Number of Mosquitoes Tested from Bristol Co. by MA DPH in 2019: 21,819**
  - + 64.6% change from 2018
  - Total Number of Mosquitoes Tested in 2018: 13,259
  - Total Number of Mosquitoes Tested in 2017: 8,635
- **Total Number of Mosquitoes Tested from Bristol Co. MCP in 2019: 13,894**
  - + 1.4% change from 2018
  - Total Number of Mosquitoes Tested in 2018: 13,701
  - Total Number of Mosquitoes Tested in 2017: 14,822
- **Total Number of Non-submitted Mosquitoes in 2019: 91,294**
  - + 287.2% change from 2018
  - Total Number of Non-submitted Mosquitoes 2018: 31,786
  - Total Number of Non-submitted Mosquitoes 2017: 23,478
- **Total Number of Non-submitted Mosquitoes from Bristol Co. by MA DPH in 2019: 54,363**
  - + 577.3% change from 2018
  - Total Number of Non-submitted Mosquitoes 2018: 9,417
  - Total Number of Non-submitted Mosquitoes 2017: 6,799
- **Total Number of Non-submitted Mosquitoes from Bristol Co. MCP in 2019: 36,391**
  - + 65.1% change from 2018
  - Total Number of Non-submitted Mosquitoes in 2018: 22,369
  - Total Number of Non-submitted Mosquitoes in 2017: 16,679

<u>2019 Combined Data:</u>

Total Samples Tested: 1,060

Total Mosquitoes Tested: 35,713

Total Non-Submitted: 91,294

Total Collected: 127,007

2018 Combined Data:

Total Samples Tested: 865

Total Mosquitoes Tested: 26,960

Total Non-Submitted: 31,786

Total Collected: 58,746

2017 Combined Data:

Total Samples Tested: 804

Total Mosquitoes Tested: 23,187

Total Non-Submitted: 23,518

Total Collected: 46,705

West Nile virus isolations 2019: 14

- **47% lower than 10-year average, 39% lower than 5-year average**
- **4 samples of *Culex pipiens/restuans* complex collected from gravid traps**
- **8 samples of *Culiseta melanura* collected from CDC light traps**
- **2 samples of *Culex salinarius* collected from CDC light traps**
- **1 human case of West Nile reported by MA DPH in Bristol County**

- WNV 2018: 62
  - 45% higher than 10-year average, 60% higher than 5-year average
  - 38 samples of *Culex pipiens/restuans* complex
  - 23 samples of *Culiseta melanura*
  - 1 sample of *Ochlerotatus canadensis*
- WNV 2017:15 Samples
- WNV 2016: 8 Samples
- WNV 2015: 14 Samples
- WNV 2014: 8 Samples

Eastern equine encephalitis (EEE) virus isolations 2019: 160

- **Worst year for EEE activity in previous 15 years**
- **496.9% higher than 10-year average, 491.0% higher than 5-year average**
- **96 samples of *Culiseta melanura*, 92 from CDC light traps and 4 from resting boxes**
- **31 samples of *Coquillettidia perturbans*, all from CDC light traps**
- **15 samples of *Ochlerotatus canadensis*, all from CDC light traps**
- **13 samples of *Culex salinarius*, all from CDC light traps**
- **2 samples of *Aedes vexans*, all from CDC light traps**
- **1 sample of *Culex pipiens/restuans* from gravid traps**
- **3 human cases of EEE**
- **1 non-human mammal case**

- EEE 2018: 0
- EEE 2017: 1 sample of *Cs melanura*
- EEE 2016: 0 samples
- EEE 2015: 0 samples
- EEE 2014: 15 samples
  - 14 samples of *Cs melanura*
  - 1 sample of *Cx pipiens/restuans* complex
- EEE 2013: 29 samples
- EEE 2012: 100 samples (2nd highest EEV activity in past 10 years)

Mosquito activity/trends for the 2019 Season

The winter of 2018-2019 was mild, with very little snowfall in Bristol County. Warmer than average temperatures kept liquid water in our white cedar/red maple swamps until the spring. Combined with above average precipitation at the end of 2018, the environment had perfect conditions for larval *Cs. melanura* survival and reproduction for 2019.

In response to the warm and wet winter, we started the surveillance program in Week 18 (first of May), a few weeks earlier than normal. Early season overall mosquito populations remained within 5- and 10-year averages, with a very notable percentage of the population being *Cs. melanura.* This trend continued steadily until mid-June, at which time *Cs. melanura* numbers increased far beyond the 5- and 10-year averages and we started to see a rise in EEE positive pools (Figure 2, Table 2). These large population numbers when combined with positive EEEv detections, triggered a decision between MA DPH and MDAR for a wide-area aerial adulticide. We returned to normal seasonal averages after the first two wide-area aerial adulticide events in August and September.

Precipitation totals and temperature averages for the year were measured using three roughly equidistant NOAA weather stations which cover the entire county (Table 4). While precipitation varies somewhat from year to year, Bristol County has been experiencing a warming trend since 2014. This year's low precipitation totals, particularly in the fall months, might be a signal that the high mosquito populations of 2019 might not be repeated in 2020.

Aerial larvicide, spring 2019

The 2019 aerial larvicide event was completed between 4/16 and 4/26/2019. Plymouth County MCP aircraft deposited 379 gallons of VectoBac 12AS liquid larvicide, applied at a rate of 1.03 pints per acre for a total area of 3028 acres. Flight path and coverage is shown in Figure 1. Sampling showed the presence of *Aedes abserratus, Ae. canadensis* and *Culiseta melanura* in most sites. Pre- and post-treatment sampling of each area showed statistically significant ($P<0.05$) population reduction in three of the five treatment areas (Table 3). No reduction was shown in the Hockomock East (Hall Street, Raynham) site; this is most likely an artifact of a very small sample size. Larvae at this site were found pre-and post-treatment in very small numbers (average 0.2 larvae/dip), which makes for very weak statistical tests. At the Hockomock West site (Raynham Dog Track, Easton), pre- and post-treatment dips found large numbers of larvae (average 1.9 larvae/dip). Although this site failed to show a statistically significant treatment effect, it should be noted that Abbott's and Henderson-Tilton tests show decreases in larval abundance. However, both the Abbott's and Henderson-Tilton tests are strongest when larvae are confined, something which is not possible in

open swamps using our current protocols. At the Hockomock West site, we noted a post-treatment decrease in larvae in the red maple dominant sampling stations, but there was no visible decrease in larval abundance where Eastern white cedar were the dominant cover.

Arbovirus activity, summer 2019

2019 saw another return of EEE to the county. First detections in *Cs. melanura* occurred in week 29 (mid-July) in Freetown, Fairhaven, New Bedford and Easton. This pattern of widespread detections continued into the next week with more detections in more towns, as well as detections in mammal biting mosquitoes. Decisions were made between MDAR and MDPH to conduct an aerial adulticide over large swaths of Plymouth and Bristol Counties, which took place in week 31 (early August). In conjunction with ground-based ULV efforts, the aerial spray greatly reduced the mosquito population (Figure 2). This reduction in population decreased the number of EEE detections, however the risk of EEE mosquitoes stayed high for the remainder of the season. These detections occurred in 12 of our 20 towns (Table 2).

West Nile virus detections were relatively low, with our first detection in mid-July. The pattern stayed low for the remainder of the season, with low numbers of detections in 7 of our 20 towns (Table 1).

At the end of the 2019 surveillance season, all 20 cities and towns in Bristol County are reported by MA DPH to be in the Low Risk category for WNV (Figure 6). For EEE, 8 cities and towns of Bristol County have been placed at moderate risk, 6 at High Risk and 6 at Critical Risk (Figure 7).

Aerial Adulticide

High numbers of positive EEE samples in *Cs. melanura* and mammal-biting vectors led to discussions between MA DPH, MDAR, SRB and impacted mosquito control districts by mid-July. The decision was made to make an aerial application of Anvil 10+10 ULV adulticide over affected parts of Bristol and Plymouth by the end of the month. Air assets, adulticide, pilots and necessary contracts were completed shortly thereafter and Bristol County had its first application over the August 9th weekend. On August 10th, our first human case of EEE was reported in Southern Bristol County. Declines in the mosquito population were noticed (Figure 2), but the number of positive

samples stayed steady. By mid-August, the EEE risk had spread to several nearby counties and out towards central Massachusetts. Another aerial event was scheduled for mid-August as weather permitted. Bristol County's portion of this event took place August 22nd to 24th. Two new cases of EEEv in humans occurred early in September, so the decision was made to conduct a third round from September 16th to 24th, this event took several days due to colder weather and rain. Pre- and post-spray event efficacy testing was performed before and after each treatment. For spray area maps, please see figures 8 through 10.

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 season was shortened by several weeks due to limited resources being directed to the more serious EEE problem in our area.

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.

BCMCP set 153 ovitraps over the 15 week season across the South Coast in potential *Ae albopictus* habitat. 62 papers from sites with presence of mosquito eggs were sent to the MA DPH insectary; of these, only 1 had viable *Ae albopictus* eggs. All detections of viable eggs from ovitraps were followed up with BG Sentinel™ trap efforts, adults were only found in New Bedford, Fairhaven and Dartmouth. No new detections were made this year.

Routine BG trap surveillance in New Bedford points to an established population along the waterfront area and around Acushnet Avenue, as well as low-level occurrences in nearby areas. The data shown in Figure 6 has been averaged by trap-night to correct for the increased trapping effort

that BCMCP has undertaken. The dotted line in Figure 5 shows an R^2 value of 0.39, 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 for the third year in a row from last year's R^2 of 0.64, 2017's 0.78 and 2016's 0.89. This is showing that we are moving away from an exponential population increase in this area.

This year, monthly larvicidal treatments were conducted at the two major infestations, the tire facilities on Washburn Street and Acushnet Avenue. An increase in the abundance of *Ae albopictus* was observed late in the season, as most of our efforts were focused on the EEE risk. BCMCP continued to hold meetings with the Board of Health in New Bedford over the past year and their level of engagement remains high.

Requests for service

Bristol County MCP received 12,550 calls for service in 2019. Call numbers were +20% higher than the previous year. We remain around 9% below the 10-year average, mostly due to changes in request grouping. 99.8% of all requests were completed, the uncompleted requests were generally too close to pesticide exclusion areas to treat safely. BCMCP stopped taking residential requests as of 9/6/19 and stopped ULV spray activities as of 9/27/19. In the past 5 years, Bristol has received 12,971 calls for service in 2014, 15,133 in 2015, 12,237 in 2016, 11,150 in 2017 and 10,444 calls in 2018.

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 step to combat virus transmission. We participated in more than 20 different varieties of public outreach projects including presentations and lectures, science fairs, school group and senior center talks, information tables at public events as well as radio, newspaper and television interviews.

Coordination between BCMCP and the local Boards of Health was ongoing relative to control/surveillance options in the vicinity of WNV and EEEv positive mosquito samples and high mosquito collections. Even though Labor Day is the unofficial end of summer, BCMCP continues to

alert the public that the seasonality of mosquito borne disease continues until the first frost in fall. Of the three human cases of EEE in Bristol this year, all occurred after mid-August. In response, we released several public reminders that although the majority of EEE cases occur in September and early October, the risk is present as long as the mosquitoes are biting. 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, mosquito news and public health notices, you can find us at @BCMCPMOSQ.

Tables and Figures

Table 1- Towns and number of West Nile virus (WNV) positive samples in 2019.

Town	WNV+ Samples
Attleboro	2
Easton	6
Freetown	2
New Bedford	1
Seekonk	1
Somerset	1
Taunton	1
Grand Total	**14**

Table 2- Towns and number of Eastern equine encephalitis virus (EEE) positive samples in 2019.

Town	EEE+ Samples
Acushnet	1
Dartmouth	6
Dighton	3
Easton	46
Fairhaven	1
Fall River	2
Freetown	16
New Bedford	34
Raynham	24
Rehoboth	18
Seekonk	1
Westport	6
Grand Total	**158**

Table 3. Statistical tests on pre- and post- treatment data for aerial larvicide in NE Bristol County April, 2019.

Asterisks indicate statistical significance (t-test, P<0.05).

Location	*Abbott's Rule*	*Henderson-Tilton*	*t-Test (P<0.05)*
Harvey St. (Control)	0.00	0.00	0.13
Hockomock East	100.00	100.00	0.34
Hockomock West	80.82	68.04	0.06
Dead Swamp West	97.26	92.17	*0.01
Dead Swamp East	94.52	93.55	*0.00
Pine Swamp	94.52	92.69	*0.00

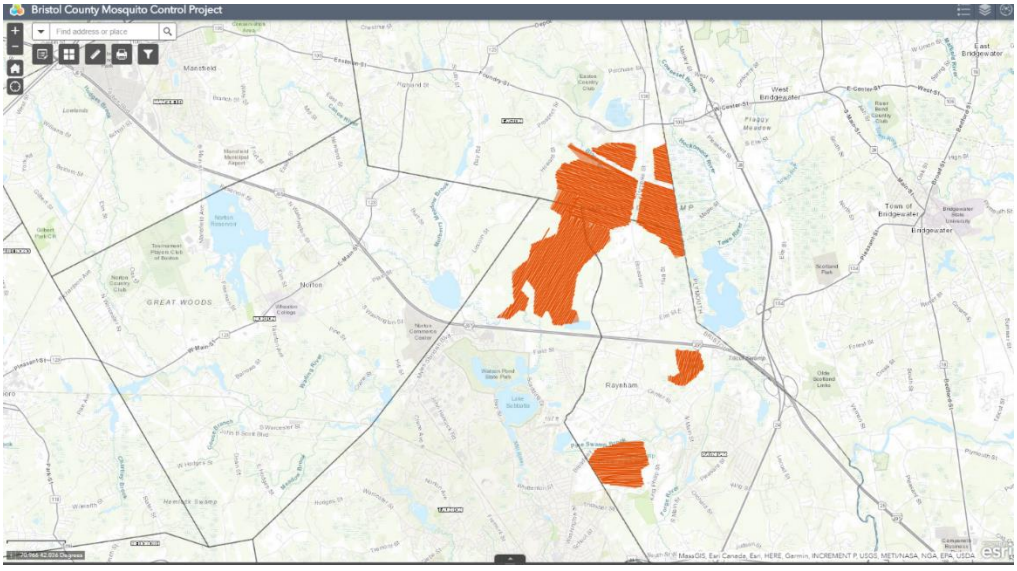

Figure 1. ArcGIS map of aerial larvicide treated areas and flight path April, 2019.

Table 4- Bristol county area average temperature, precipitation totals in inches and deviation from norm as of 12/31/19 (NOAA 2019)

	New Bedford	*Providence*	*Taunton*	*Area average*
Precipitation total (in)	43.84	51.97	48.6	48.13
Deviation from normal	-4.52	+4.79	-1.4	-1.41
Temperature average (F)	50.4	51.8	50.7	50.96
Deviation from normal	+1.0	+0.9	+1.4	+1.1

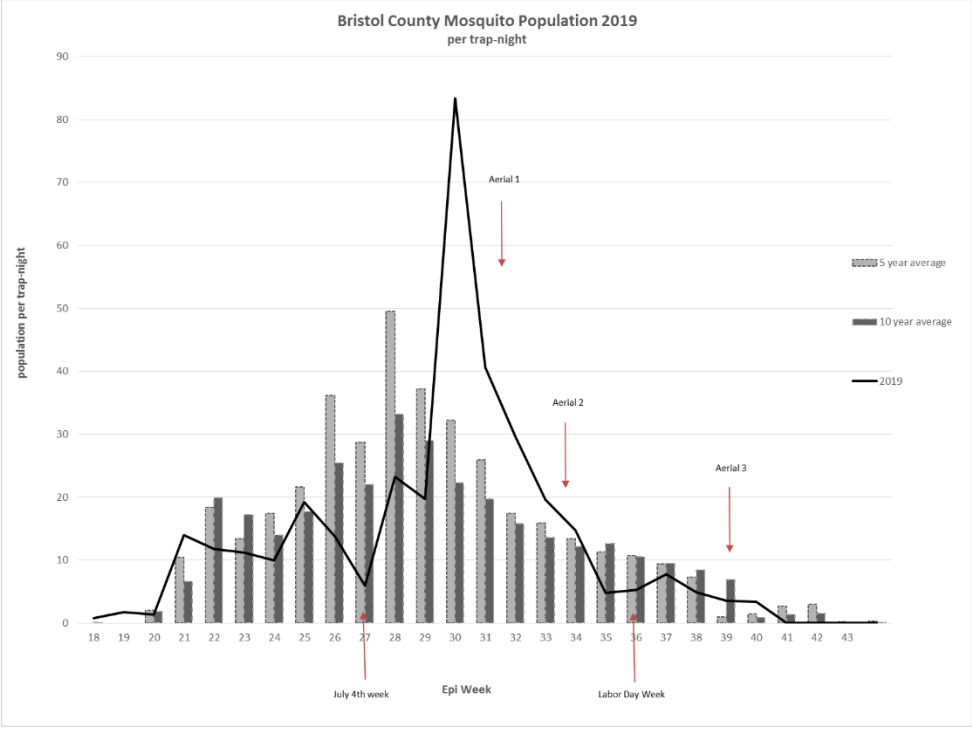

Figure 2- 2019 population totals per trap-night by epi week compared to 5- and 10-year average. The population dip at week 27 is an artifact of reduced trapping due to the July 4th holiday week.

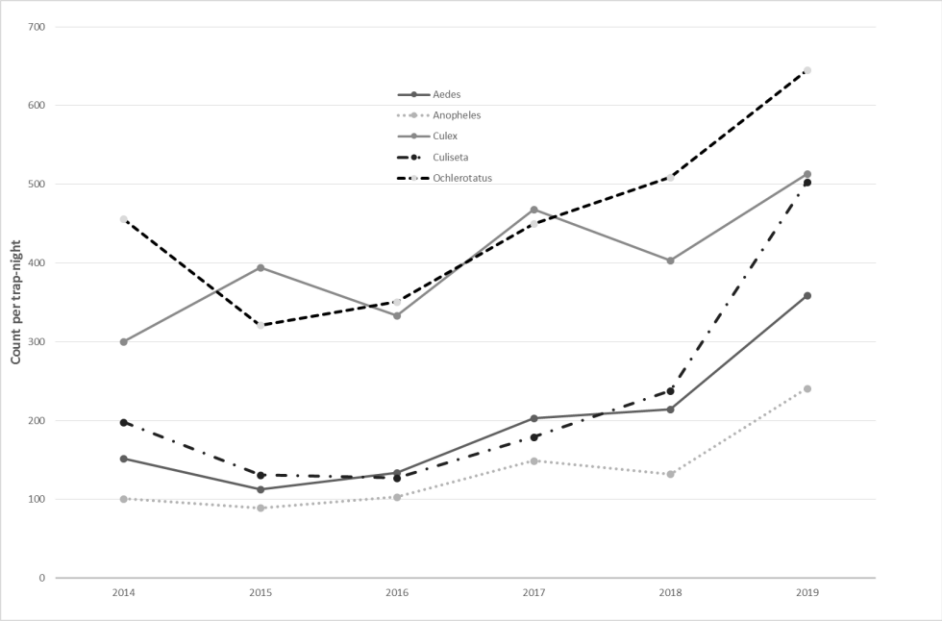

Figure 3- Mean number of observed mosquitoes by genus captured per trap-night by BCMCP and MA DPH in Bristol County, MA 2014 to 2019.

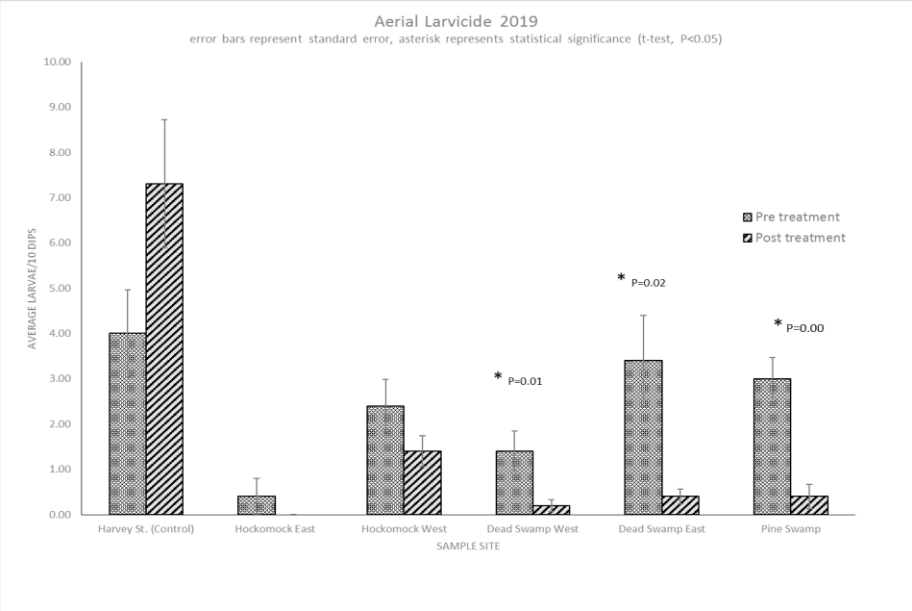

Figure 4- Pre- and post-treatment larval populations in the Hockomock, Pine and Dead Swamps, April 2019. Error bars represent standard error, asterisks denote statistical significance (t-test, P<0.05).

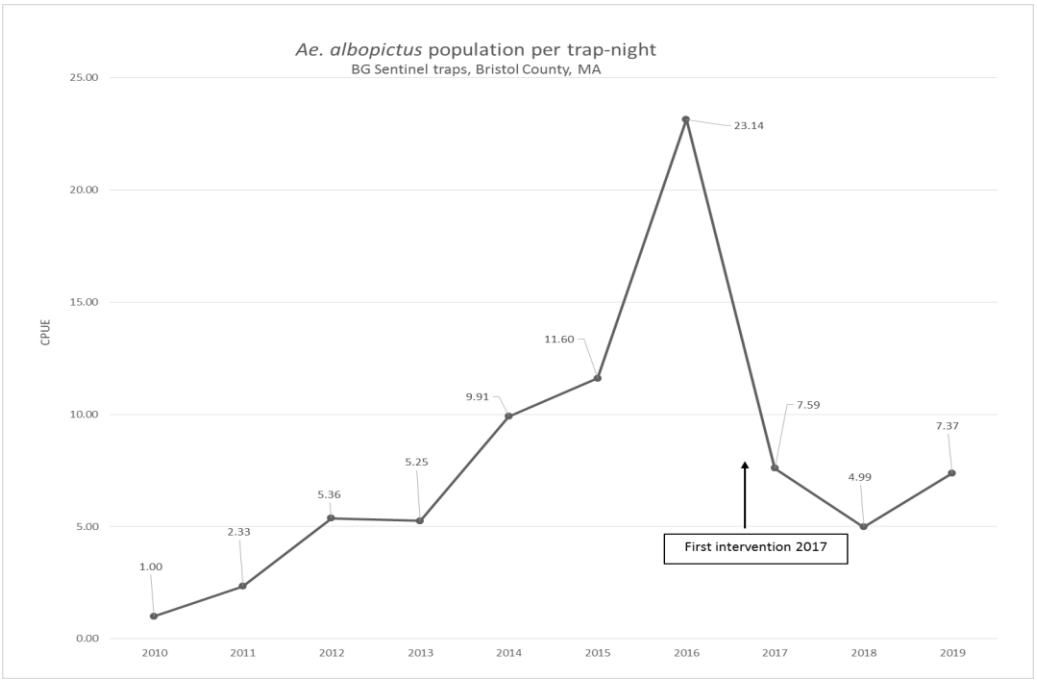

Figure 5- Population increase for Asian tiger mosquitoes in all traps in New Bedford, 2009-2019. Data normalized to decrease effects of increased trap effort.

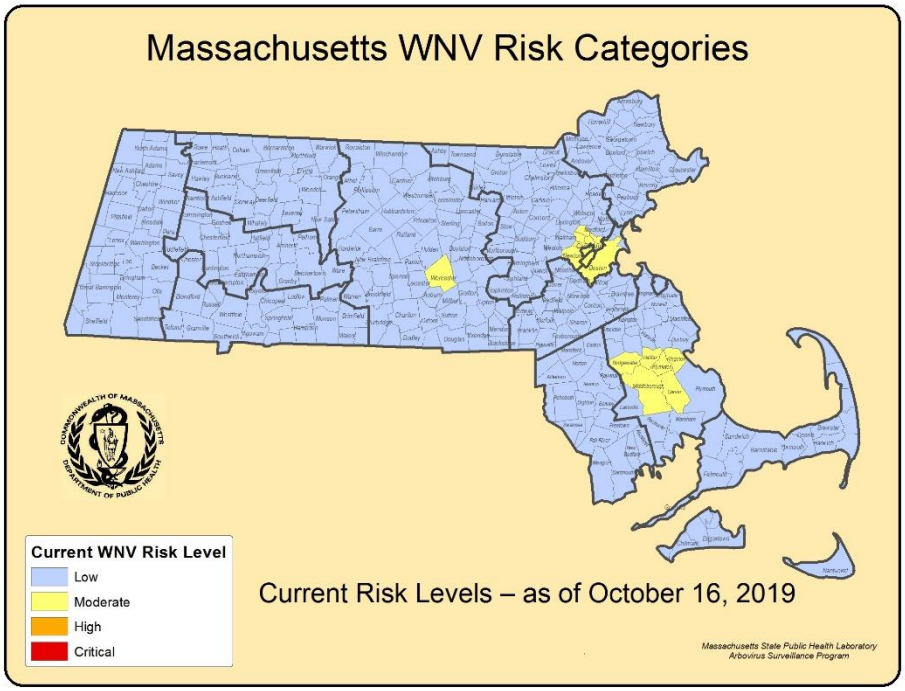

Figure 6- Massachusetts Dept. of Public Health West Nile virus risk map for the end of the 2018 season.

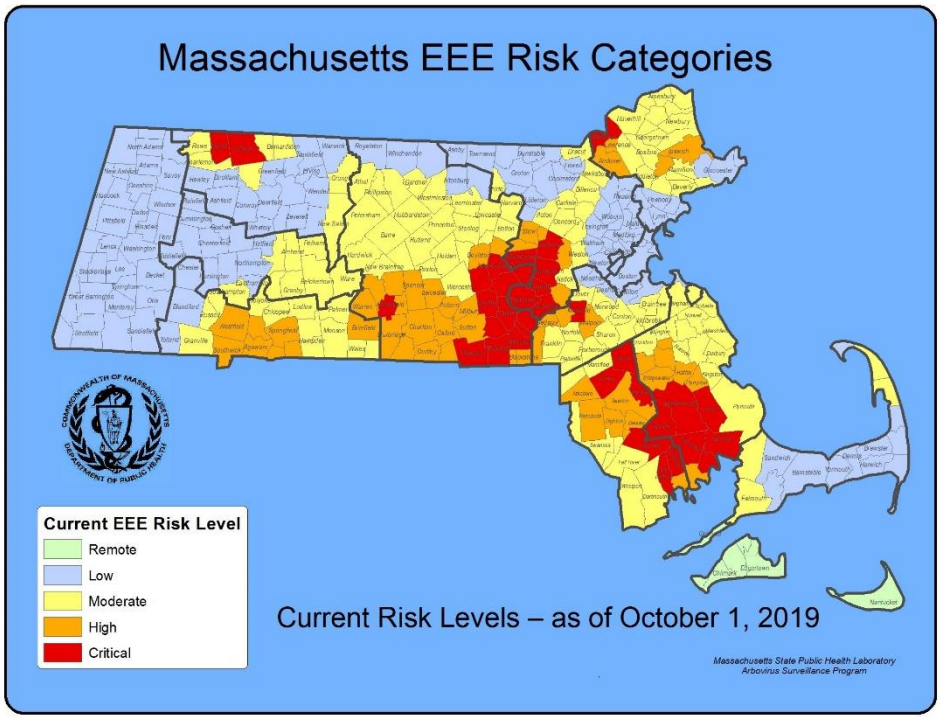

Figure 7- Massachusetts Dept. of Public Health Eastern Equine Encephalitis virus risk map for the end of the 2019 season.

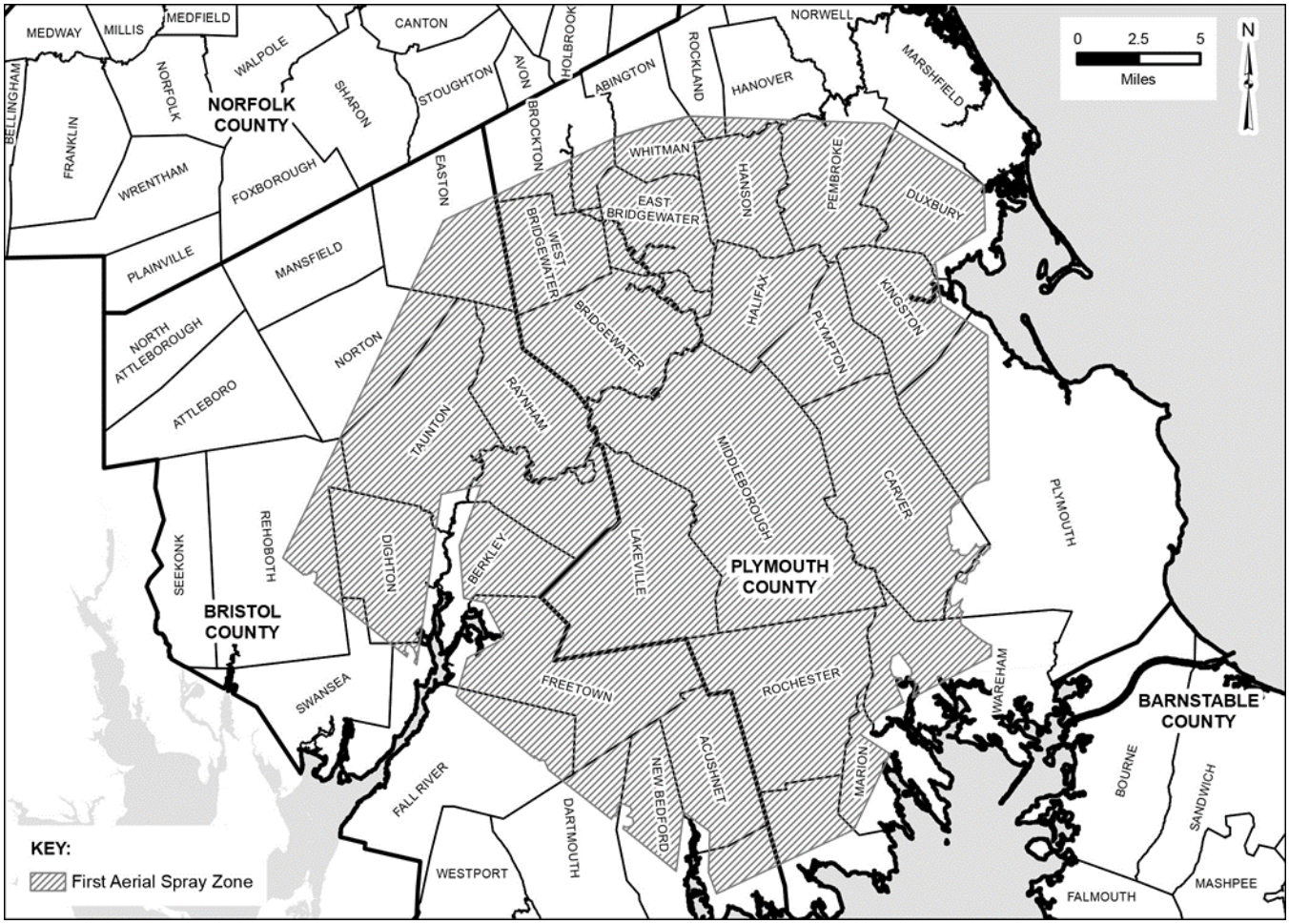

Figure 8- Area treated during first aerial adulticide event, August 9 through 10, 2019.

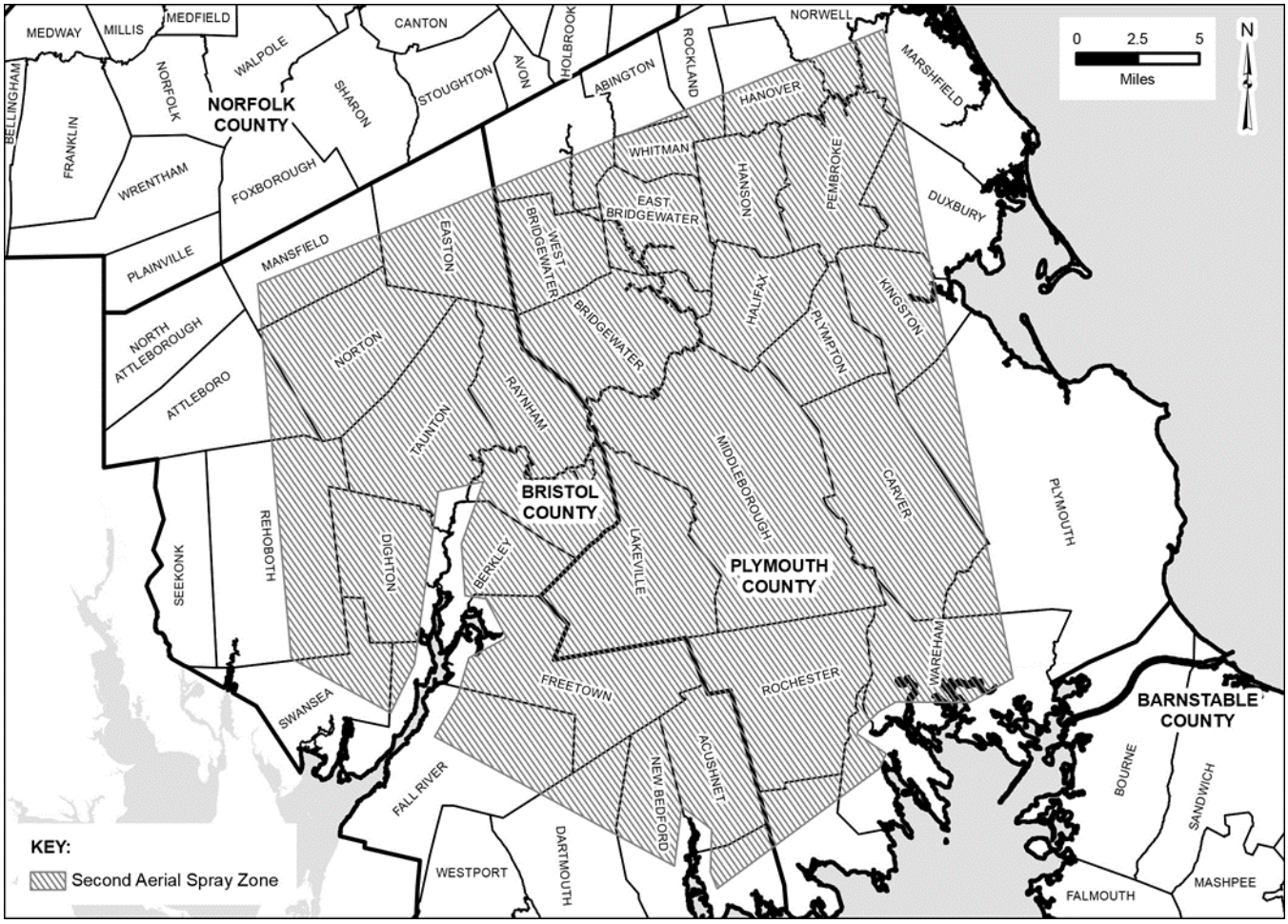

Figure 9- Area treated during second aerial adulticide event, August 22 through 24, 2019.

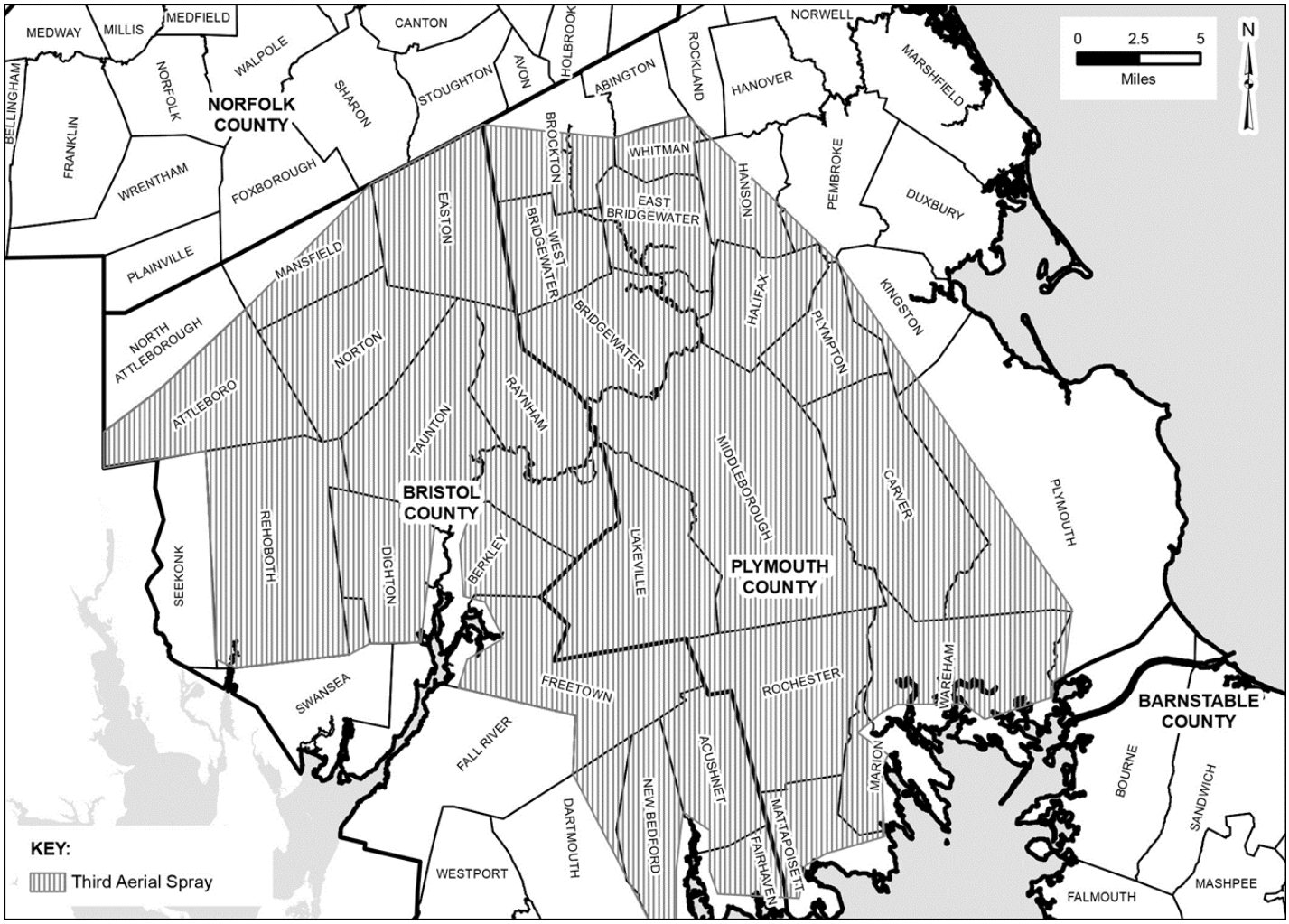

Figure 10- Area treated during third aerial adulticide event, September 16 through 24, 2019.

Prepared by Todd B Duval, Entomologist

Timestamp	Town/City	Sections Completed:	Control Actions:	Reason for Control	Comments:
7/26/2019 10:40	Easton, Fairhaven, Freetown, New Bedford	All	Catch Basin Treatment, Ground ULV Treatment, Public Outreach (including social media), Supplemental Trapping	EEE Positive Pool, WNV Positive Pool	
7/31/2019 9:30	Raynham, Easton, Fairhaven, Rehoboth, New Bedford, Dighton, Freetown	All	Catch Basin Treatment, Ground ULV Treatment, Public Outreach (including social media), Supplemental Trapping	EEE Positive Pool	Increased ULV applications around all EEE positive trap locations
9/6/2019 2:23	New Bedford	All	Ground ULV Treatment	EEE Positive Pool, Mayor's request for City parks	In response to first EEE detection reported on 7/17/19, sprayed 7/18/19
9/6/2019 2:24	Raynham	North	Ground ULV Treatment	EEE Positive Pool, Request	Response to EEE reported 7/17, sprayed 7/19
9/6/2019 2:26	Fairhaven	Northwest	Ground ULV Treatment	EEE Positive Pool, Request	Response to EEE reported 7/23, sprayed 7/26. Delayed because of rain.
9/6/2019 2:28	Freetown	Southeast	Ground ULV Treatment	EEE Positive Pool, Request	EEE detection reported 7/23, sprayed 7/26. Delayed due to rain
9/6/2019 2:28	New Bedford	All	Ground ULV Treatment	Mayor's request for City parks	
9/6/2019 2:30	Rehoboth	Center, South	Ground ULV Treatment	EEE Positive Pool, Request	EEE reported 7/24, sprayed on 7/26.
9/6/2019 2:32	Easton	South	Ground ULV Treatment	EEE Positive Pool, Request	EEE reported 7/24, sprayed 7/29. Was in area on 7/24 but was before release of positive results.
9/6/2019 2:33	New Bedford	North	Ground ULV Treatment	EEE Positive Pool, Request	EEE detected 7/24, sprayed 7/26
9/6/2019 2:35	New Bedford	North	Ground ULV Treatment, Public Outreach (including social media)	Mayor's resquest to cover trap area	Every Tuesday the Mayor request sections of the City, mostly the Northern area be sprayed. 7/30
9/6/2019 2:36	Dighton	All	Ground ULV Treatment	EEE Positive Pool	EEE reported 7/30, sprayed 7/31

9/6/2019 2:38	Freetown and New Bedford	North, South	Ground ULV Treatment	EEE Positive Pool	Since the Freetown and New Bedford traps are located close together, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. Sprayed 8/2
9/6/2019 2:41	Easton and Raynham	North, South	Ground ULV Treatment	EEE Positive Pool	Since the Easton and Raynham traps are located close, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. Sprayed 7/31 in response to detection reported 7/30
9/6/2019 2:43	New Bedford	All	Ground ULV Treatment, Public Outreach (including social media)	EEE Positive Pool, Mayor's request for City parks	While spraying the City parks, areas around the trap site were sprayed on 8/1, in response to continued EEE detection on 7/31
9/6/2019 2:46	Raynham and Taunton	Center, South	Ground ULV Treatment	EEE Positive Pool, Request	EEE reported at 2nd Raynham site on 7/31, area was treated 8/1. Since the trap sits on the Taunton line, areas close to the trap in Taunton were treated as well.
9/6/2019 2:47	Rehoboth	All	Ground ULV Treatment	EEE Positive Pool, Request	Continued EEE reported in Rehoboth on 7/31, sprayed 8/2.
9/6/2019 2:49	Easton	South	Ground ULV Treatment, Public Outreach (including social media)	EEE Positive Pool	Continued detections reported 8/1, sprayed 8/2
9/6/2019 2:50	Fall River	Northwest	Ground ULV Treatment	EEE Positive Pool	EEE reported 8/2, sprayed area 8/5
9/6/2019 2:52	New Bedford and Freetown	North, South	Ground ULV Treatment	EEE Positive Pool, Mayor's request for trap areas	Since the Freetown and New Bedford traps are located close, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. Sprayed 8/6 because of continued activity.
9/6/2019 2:54	Raynham	All	Ground ULV Treatment	EEE Positive Pool, Request	EEE reported at 2nd Raynham trap site, close to Easton trap site on 8/6. Sprayed area 8/7.
9/6/2019 2:56	Easton	Southeast	Ground ULV Treatment	EEE Positive Pool	Easton's 2nd trap location reported EEE 8/6, sprayed area 8/7
9/6/2019 2:58	New Bedford	All	Ground ULV Treatment	EEE Positive Pool, Mayor changed the park day to Friday because of all the EEE detections	Sprayed parks and trap area due to sustained activity 8/9
9/6/2019 3:00	New Bedford and Freetown	North, South	Ground ULV Treatment	EEE Positive Pool	Since the Freetown and New Bedford traps are located close, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. Sprayed 8/12

9/6/2019 3:03	Raynham and Easton	All, South	Ground ULV Treatment	EEE Positive Pool	Since the Easton and Raynham traps are located close, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. 3rd Raynham trap location reported EEE 8/13, sprayed 8/14.
9/6/2019 3:04	Dighton	All	Ground ULV Treatment	EEE Positive Pool, Request	EEE reported 8/13, sprayed 8/14
9/6/2019 3:06	New Bedford	All	Ground ULV Treatment	EEE Positive Pool, Mayor's City park request	Areas around the traps and city parks sprayed 8/16
9/6/2019 3:07	Rehoboth	Center	Ground ULV Treatment	EEE Positive Pool	2nd Rehoboth trap reported EEE 8/14, sprayed area 8/16
9/6/2019 3:08	Westport	North	Ground ULV Treatment	EEE Positive Pool	Trap site reported EEE 8/15, sprayed 8/19
9/6/2019 3:10	New Bedford and Freetown	North, South	Ground ULV Treatment	EEE Positive Pool, Mayor's request for trap sites	Since the Freetown and New Bedford traps are located close, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. Sprayed 8/21 with sustained activity.
9/6/2019 3:23	Norton and Attleboro	South, Southeast	Ground ULV Treatment, Public Outreach (including social media)	EEE Positive Pool, EEE positive Goat	Since the location of the goat was located in Norton but on the Attleboro line, all streets in the area, approximately 2 mile radius was treated in the 2 towns. Reported 8/19
9/6/2019 3:24	Freetown and New Bedford	North, South	Ground ULV Treatment	EEE Positive Pool, Mayor's request for trap sites to be treated	Since the Freetown and New Bedford traps are located close, 2 applicators, one in each town, sprayed most streets around the trap, meeting at the town line. Sprayed 8/20
9/6/2019 3:26	Seekonk	West	Ground ULV Treatment	WNV Positive Pool	WNV reported 8/20, sprayed 8/21 around trap site
9/6/2019 3:27	Easton	South	Ground ULV Treatment	EEE Positive Pool	Sustained activity and new EEE reported 8/21, sprayed 8/22
9/6/2019 3:28	New Bedford	All	Ground ULV Treatment	EEE Positive Pool, Mayor's City parks	sprayed 8/23
9/6/2019 3:31	Fairhaven	Center, South	Ground ULV Treatment	Request, EEE Human case	Areas around the human case were sprayed

9/6/2019 3:33	Fairhaven	All	Ground ULV Treatment	Request, EEE human case	Continued to spray in the area and residential request 8/28

Project Name: __Bristol County Mosquito Control Project_____
FY2020 Proposed Cherry Sheet Assessments Estimates
Based on the preliminary proposed Project budget
(2018 Equalized Valuations)

Name of Municipality	% of Total Budget	Project Share Amount*	State Reclamation Mosquito Control Board Share Amount*	Total Assessment Estimate*
ACUSHNET	2.61%	$40,847.00	$1,699.00	$40,106.00
ATTLEBORO	6.05%	$96,874.00	$4,030.00	$94,473.00
BERKLEY	2.18%	$34,043.00	$1,416.00	$33,059.00
DARTMOUTH	10.11%	$159,048.00	$6,617.00	$157,362.00
DIGHTON	2.79%	$43,923.00	$1,827.00	$42,717.00
EASTON	5.26%	$84,513.00	$3,516.00	$83,579.00
FAIRHAVEN	2.87%	$44,392.00	$1,847.00	$43,784.00
FALL RIVER	7.73%	$112,453.00	$4,679.00	$114,615.00
FREETOWN	4.36%	$68,741.00	$2,860.00	$67,496.00
MANSFIELD	4.73%	$76,048.00	$3,164.00	$74,881.00
NEW BEDFORD	6.84%	$103,516.00	$4,307.00	$102,176.00
NORTH ATTLEBORO	4.83%	$75,773.00	$3,153.00	$76,476.00
NORTON	4.49%	$71,289.00	$2,966.00	$68,650.00
RAYNHAM	3.50%	$56,609.00	$2,355.00	$54,935.00
REHOBOTH	5.63%	$88,106.00	$3,666.00	$87,462.00
SEEKONK	3.48%	$55,817.00	$2,322.00	$54,968.00
SOMERSET	3.04%	$39,221.00	$1,632.00	$39,116.00
SWANSEA	3.79%	$60,058.00	$2,499.00	$59,851.00
TAUNTON	8.49%	$131,126.00	$5,456.00	$128,176.00
WESTPORT	7.22%	$112,043.00	$4,662.00	$110,794.00
		$1,554,440.00	$64,673.00	$1,619,113.00

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

(2018 Equalized Valuations)

(*Updated: 5/17/17)*

Figure 5

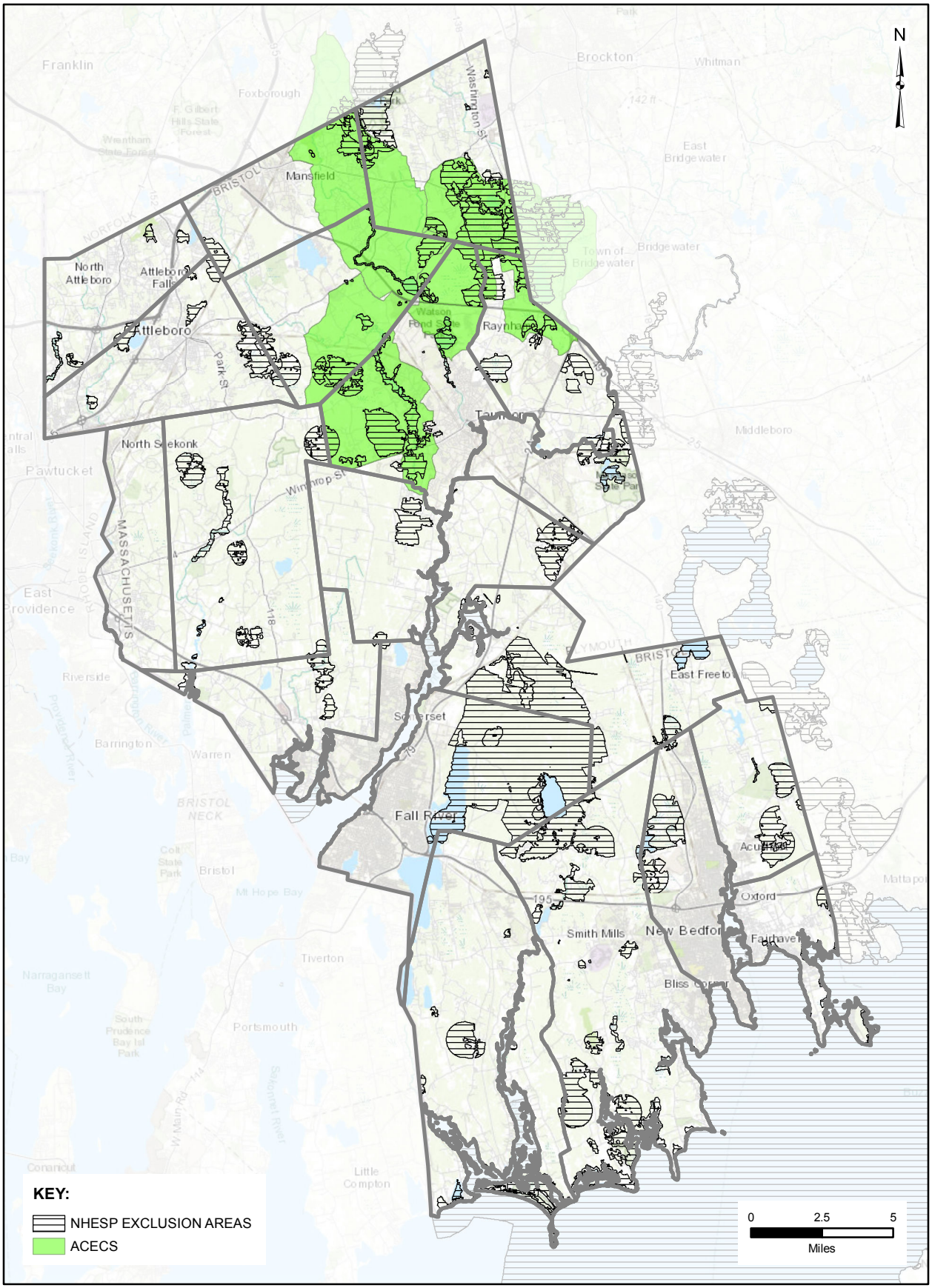

Figure 6. Exclusion Areas

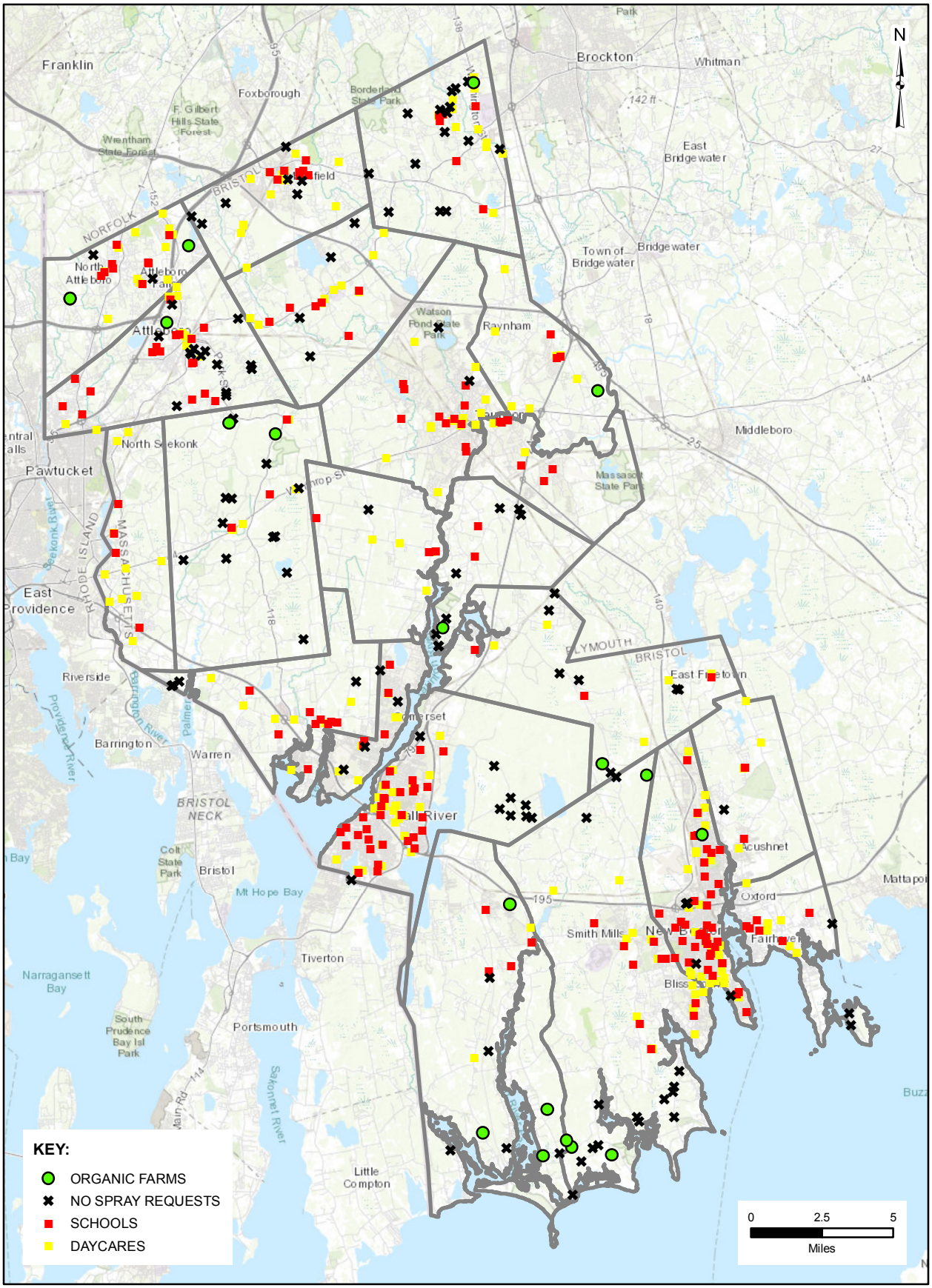

Figure 7. No Sprays