MASSACHUSETTS MOSQUITO CONTROL

ANNUAL OPERATIONS REPORT

Year Report Covers: 2020 Date of Report: 01/22/2021

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: 11
Part time: 1
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- Christopher Beale, 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
9 ULV sprayers (list type) 4 London Fog (GPS), 2 Guardian (GPS), 1 Curtis DynaJet (GPS), 1 Beecomist, 1 London Air
10 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):	4,240 lbs
VectoLex WSP	73049-20	1 per 50 sq. ft.	Hand	Larvae	☒ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	270 lbs
VectoMax WSP	73049-429	1 per 50 sq. ft.	Hand	Larvae	☒ Catch basins ☐ Containers ☐ Wetland ☐ Other (please list):	264 lbs
VectoBac 12AS	73049-38	1 pint per acre	Aerial	Larvae	☐ Catch basins ☐ Containers ☒ Wetland ☐ Other (please list):	362 gallons
Altosid XR Briquets	2724-421	1 per 100 sq. ft.	Hand	Larvae	☐ Catch basins ☒ Containers ☐ Wetland ☐ Other (please list):	1.19 lbs
Altosid P35	89459-95	5 lbs per acre	Aerial	Larvae	☐ Catch basins ☐ Containers ☒ Wetland ☐ Other (please list):	1,765 lbs
				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 tablets. An aerial larvicide application was conducted over the Hockomock and Bolton Swamps at the end of April 2020. Approximately 2,896 acres were treated to control a variety of spring species and Cs. melanura, an important EEE vector. A second application was made to specific habitat within the same swamps to control Cs. melanura. Approximately 353 acres were treated with methoprene in May.

Please attach a map of your service area (or a website link to that map). Figures 2, 3, 4 and 5

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 2020 season, Bristol County had one human cases of WNV, similar to 2019. In 2019, three human cases of EEE were reported, all resulting in fatalities, there were no cases in 2020.

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 soley 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
Duet	1021-1795-8329	0.64 oz/acres	Truck mounted ULV	870 gallons

Mavrik	2724-478	0.5 oz/ 5 gallons water	Backpack	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 6

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 and continued into 2020. 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	81,145 ft
☒ Mechanized cleaning	10,385 ft
☒ Stream flow improvement	
☒ Other (please list): Reclaim	81,145 ft

Comments: Culvert cleaning and stream flow improvement cumulative length are included in mechanized and hand cleaning. Cumulative mechanized brush mowing 14.47 acres (21,070 linear feet).

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

Maintenance Type	**Estimate of cumulative length of ditches maintained (ft)**
☒ Hand cleaning	3,545 ft
☒ Mechanized cleaning	2,160 ft
☒ Other (please list): Reclaim	3,545 ft

Comments: _____

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

Comments: Monitored 33,786 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: Bristol County Mosquito Control does not have an active Open Marsh Water Management program.

What months is this program active?

Please give an estimate of total square feet or acreage:

Comments: _____

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 mechanized water management sites regularly to check for blockages or debris that may obstruct the flow of water and to meet any additional recommendations 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 common species using CDC bottle bioassay protocols in August 2020. Surveillance collections were performed for the aerial adulticide event held in Plymouth County in August 2020.

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*
- ☐ Others (please list):
- ☒ *Oc. abserratus*
- ☒ *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): 52,378
Number of adult mosquito pools collected this season (submitted and unsubmitted): 1,595
Number of ovitrap collections this season, if any: 131
Any other trap collections of note (please describe): 85 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: 461
How many pools do you submit weekly on average? 24.26

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)	0	0	0
☒ West Nile Virus (WNV)	12	0	1
☐ Other (please list):			

Comments: West Nile virus detections were 47% lower than 10-year average. There were no EEE virus detections this year.

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	2 towns moderate
WNV	Low	5 towns moderate

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

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: This year's covid-19 pandemic has severely restricted our public outreach in 2020. We were only able to attend outreach events before March. Many presentations moved online, many more were cancelled outright.

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 and filmed PSA for local communities on mosquito control and prevention.

Estimate the audience reached this year using the education/outreach methods above: ~3000+
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. New Bedford Public access TV
2. DoubleACS TV Attleboro's Public access
3. Dartmouth NRT outreach program

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. BCMCP continued working with the Northeast Regional Center for Excellence in Vector Borne

Diseases at Cornell University on Cs. melanura control efforts, a paper will be published in 2021. Priscilla presented at the Northeast Regional Center for Excellence in Vector Borne Diseases' Boot Camp on "Vector control for mosquitoes". She also presented and a panelist at the EPA's "Mosquito Threats and Controls: A panel discussion for camp and recreational land managers".

☒ 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. Todd helped teach an online mosquito ID workshop as part of the annual NMCA Mosquito Mayhem event in May. A wetlands team meeting with all mosquito control districts represented was held in early February at the Norfolk County Mosquito Control District offices.

☒ 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 Buzzards Bay Coalition (BBC), Fairhaven Acushnet Land Preservation Trust (FALPT) and Dartmouth Natural Resources Trust (DNRT) on water management projects. Diana is a member of the 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 An evaluation of Ae. albopictus control methods with the In2Care system was conducted in August with Veseris Inc. Met and provided mosquito specimens to Vector Identification Tool Inc. The company is creating a camera based identification method for mosquitoes.

List any training/education your staff received this year: "Right to Know" and tick education was provided. Multiple state required training through PACE. EPA training on the "future of mosquito control".

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: Priscilla was elected as the American Mosquito Control Associations' North Atlantic regional director representing the 9 states in the region.

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. ArcMap, ArcGIS Online, and QGIS have all been used for map creation and data sharing.)
☒ 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: A major upgrade to the truck based ULV machines was completed in 2020. This included new recording devices for pesticide applications and tablets in the vehicles. The new data collection software records ULV applications and provides routing information for the spray technicians. This has increased productivity, reduced wait time between residential requests and application and reduced time spent mapping spray routes.

Describe any difficulties your program had with IT software/equipment this year: There were unanticipated issues with the rollout of the data collection program upgrade. These were addressed throughout the spring and summer to resolve the issues with the company.

Comments: _____

REVENUES & EXPENDITURES

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

	Date of Fiscal Year	**Approved Budget**	**Notes**
Previous	FY 19	$1,473,403.00	
Current	FY 20	$1,532,339.00	
Future	FY 21	$1,639,934.00	

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 21 Cherry Sheet Assessment, figure 7

Comments: _____

SERVICE REQUESTS

How many service requests did you receive this season? 12,979
How many were for larviciding? 122
How many were for adulticiding? 12,857

Was this an increase or decrease over last season? Increase

Comments: This year we saw a 2.4% increase in adult spray requests compared to 2019. 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? 128

Was this an increase or decrease over last season? Increase

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 8.

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. As a member of the BBC Restoration Advisory Committee, Diana provided review and comment on various proposed restoration projects.

- ☒ 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. 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. Working with DER on an abandon cranberry bog restoration in Freetown.

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

  Describe: Priscilla was appointed to the state's "Mosquito control for the 21st century" task force representing the Superintendents/Directors of a regional mosquito control. NMCA, NMCA annual meeting, regional EEE meeting. Cooperative research with MCPs, DPH, MDAR and Northeast Regional Center for Excellence in Vector-Borne Disease on solutions to control Cs. melanura. 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. Participated in a MA, RI and CT regional EEE monthly conference call.

- ☒ 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, including the opening of beach crossings and the clearing of salt marsh ditches and runnels in many coastal towns to allow fish access.

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 9 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: _____

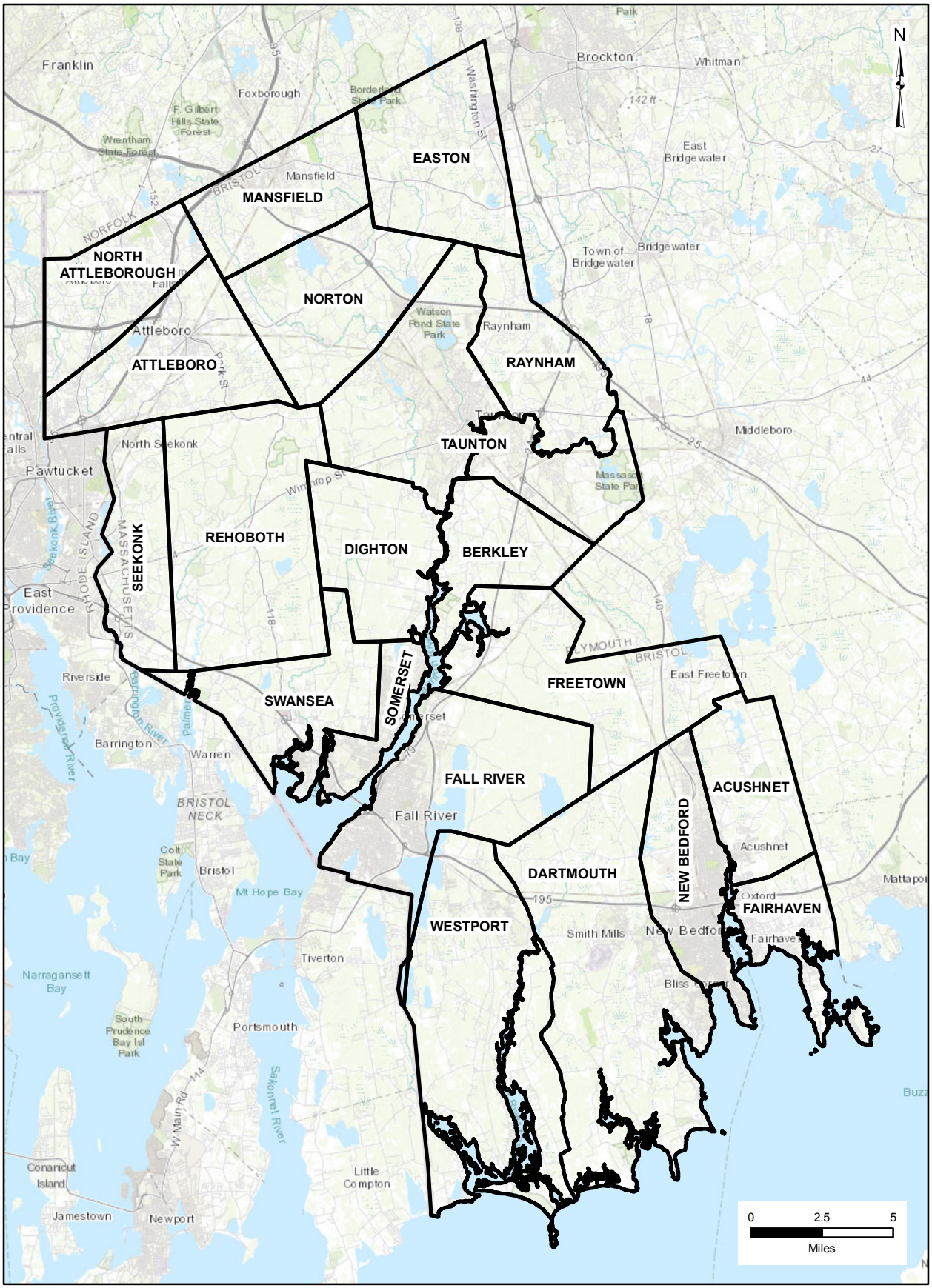


Figure 1. Bristol County

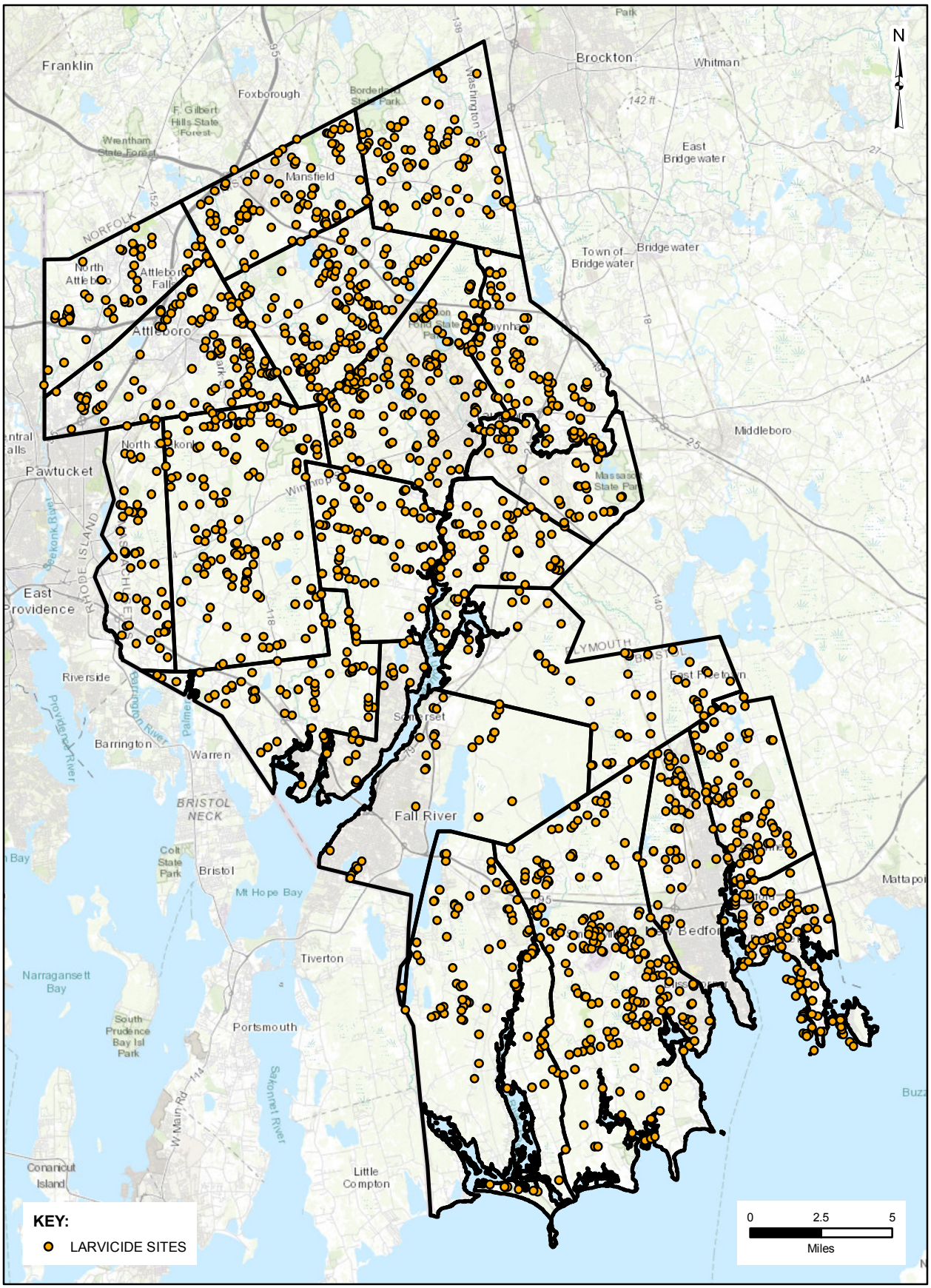


Figure 2. 2020 Larvicide Sites

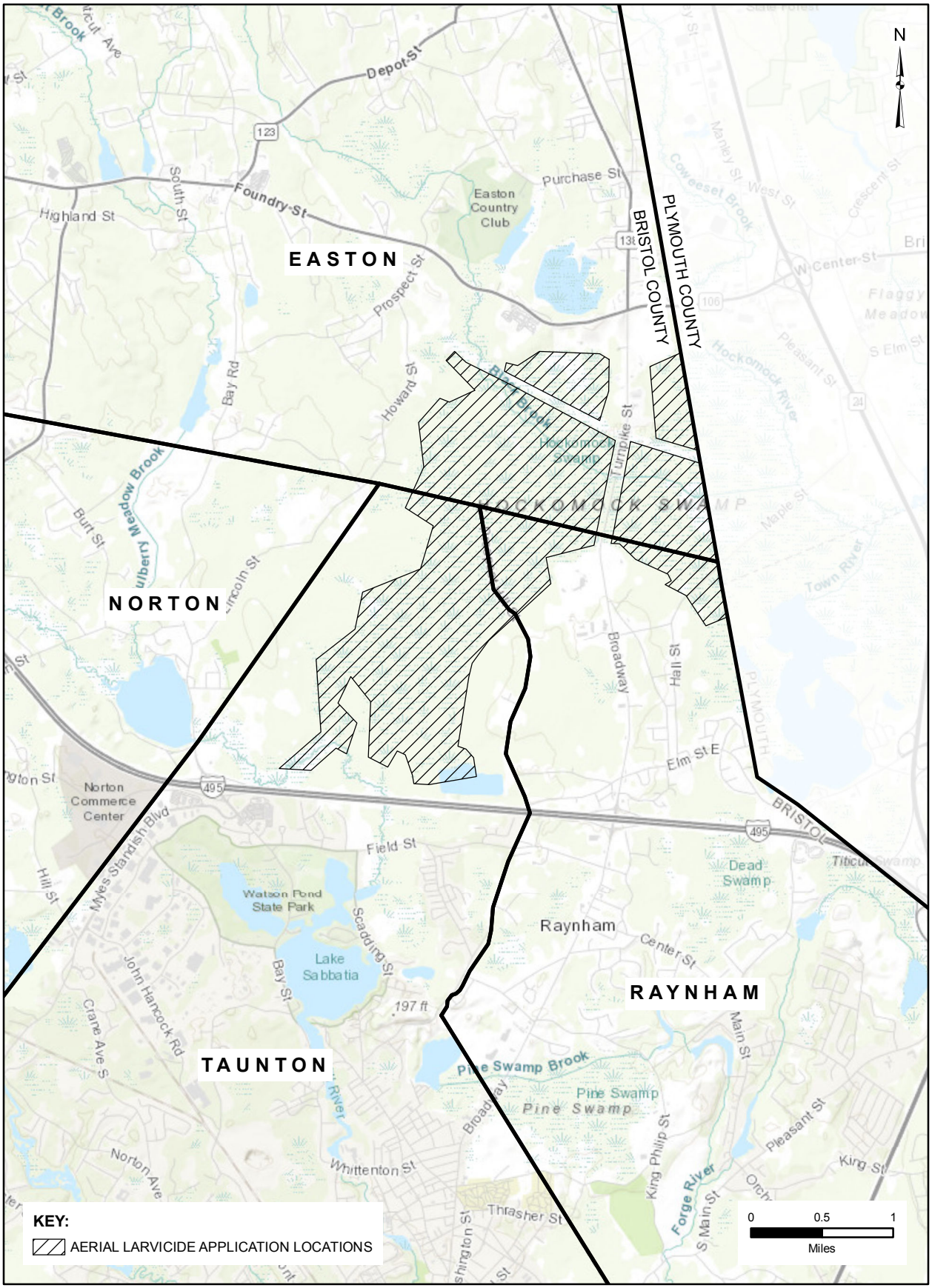
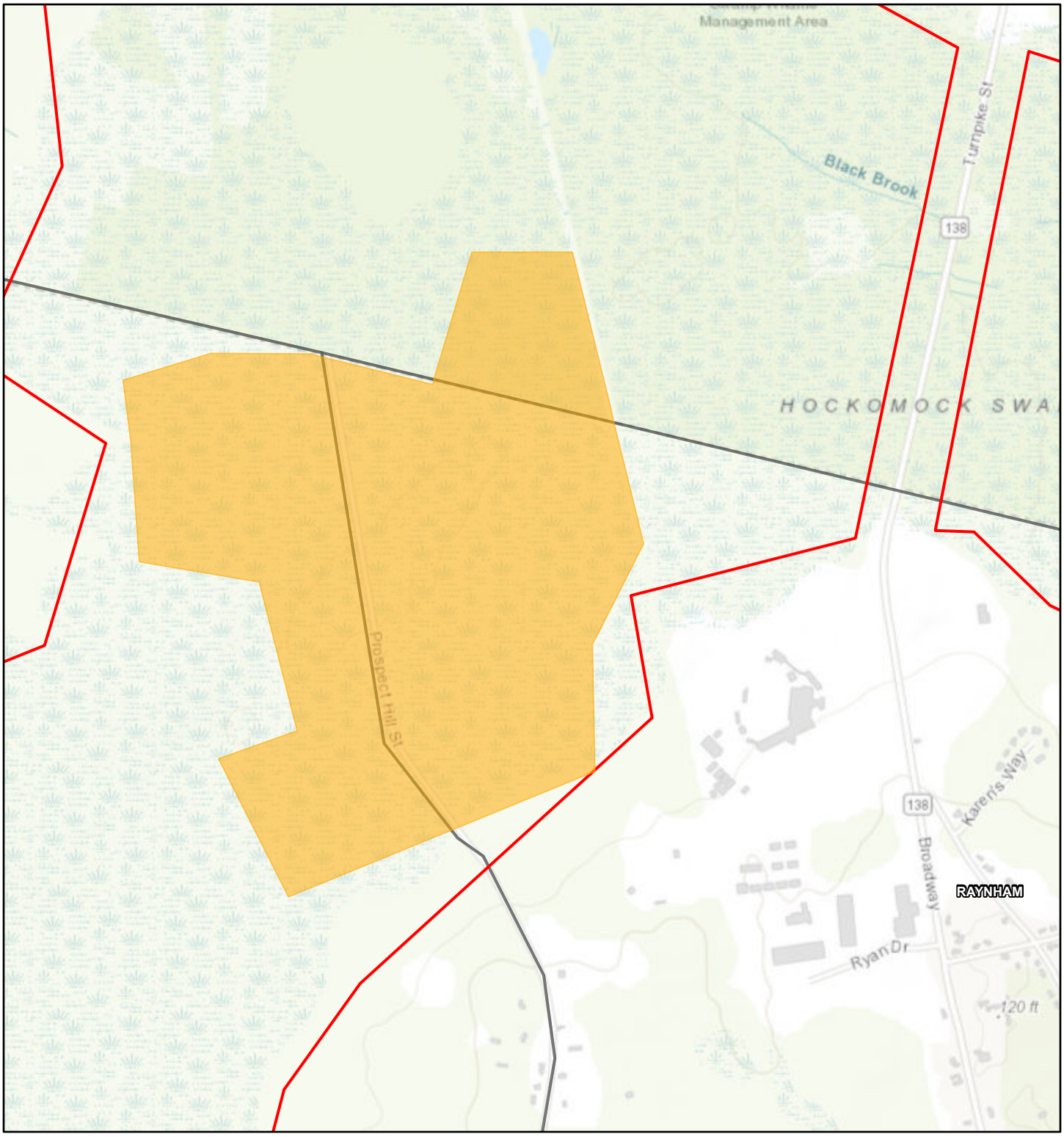


Figure 3. Aerial Bti Larvicide Application Locations within Bristol County

BCMCP Web Map



1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Yes

2020_Proposed_Methoprene_Blocks

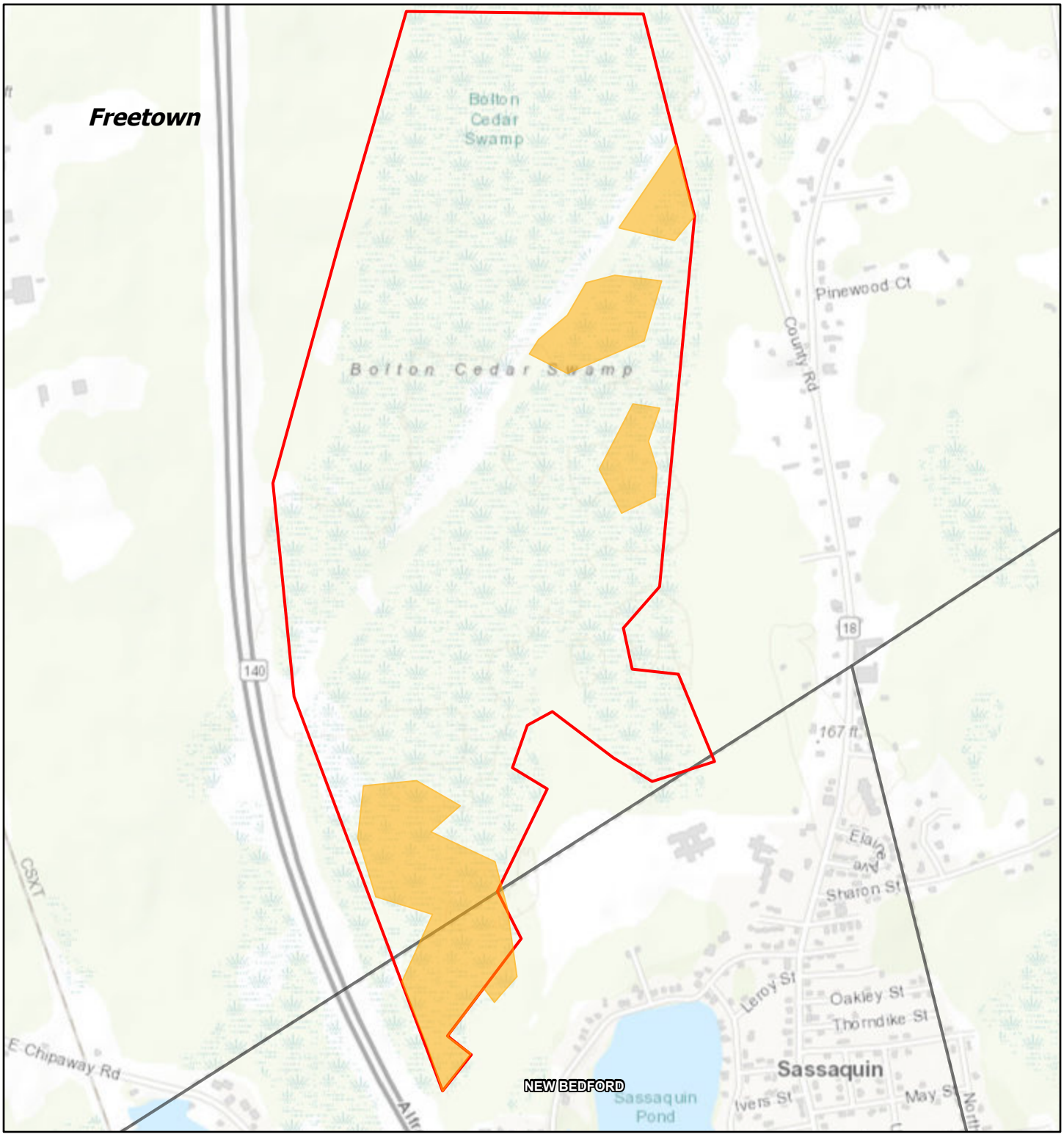
2020_Proposed_Spray_Blocks

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 4.

Bristol County Mosquito Control Project
MassGIS, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | USGS, MassGIS | MassDEP |

BCMCP Web Map



1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Bristol County Towns

2020_Proposed_Methoprene_Blocks

2020_Proposed_Bti_Blocks

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 5.

Bristol County Mosquito Control Project

MassGIS, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | USGS, MassGIS | MassDEP |

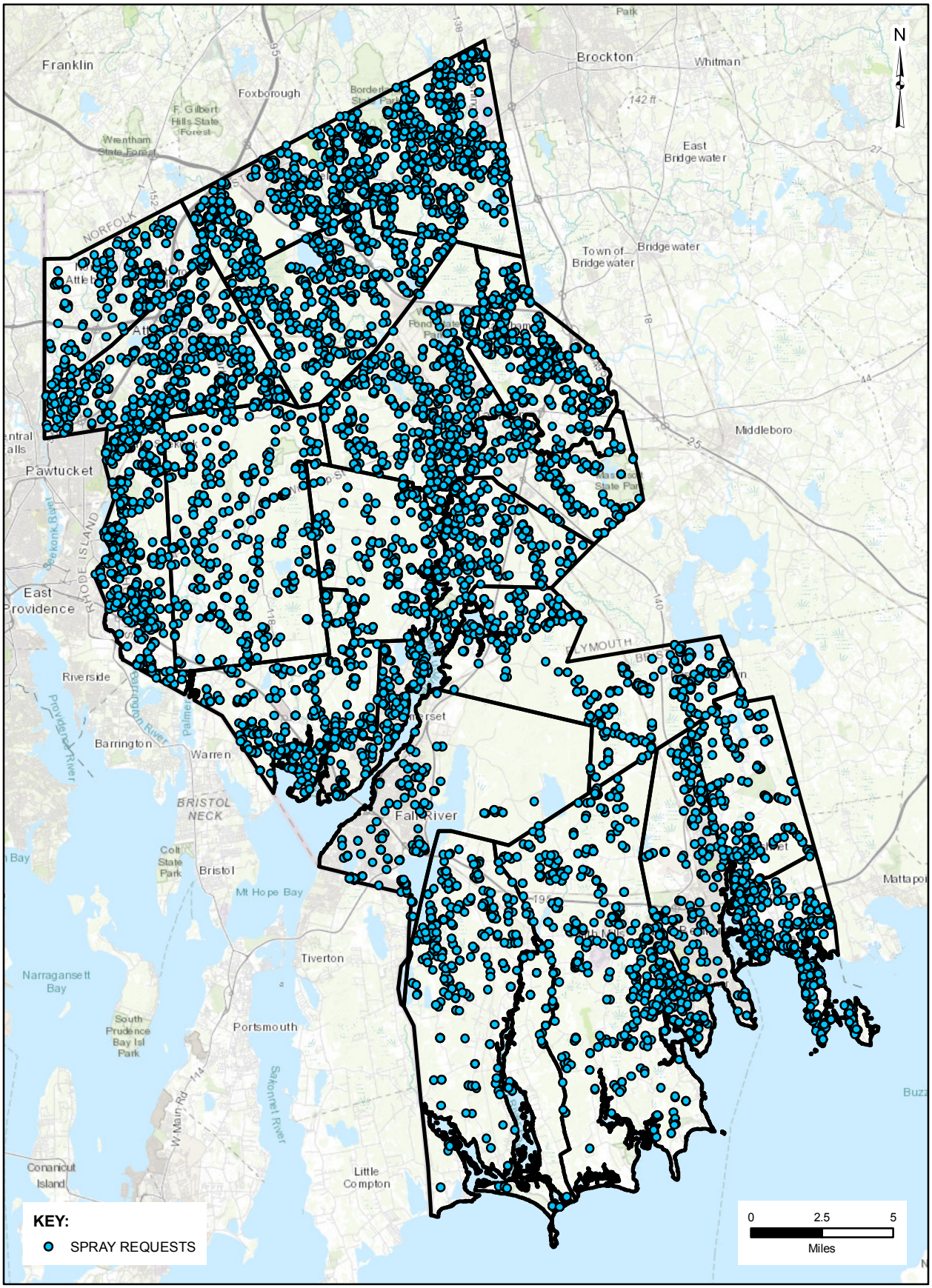


Figure 6. 2020 Spray Requests

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

SUPERINTENDENT
PRISCILLA MATTON, MS

Monday, January 04, 2021

Bristol County Mosquito Control Project (BCMCP)

End of the 2020 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 2020: 649**
  - -63% change from 2019
  - Total Samples Submitted for Testing 2019: 1060
- **Total Samples Submitted from Bristol Co. by MA DPH in 2020: 188**
  - -65% change from 2019
  - Total Samples Submitted for Testing 2019: 536
- **Total Samples Submitted from Bristol Co. MCP in 2020: 461**
  - -12% change from 2019
  - Total Samples Submitted for Testing 2019: 524
- **Total Number of Mosquitoes Tested from Bristol Co. in 2020: 20,181**
  - -77% change from 2019

- Total Number of Mosquitoes Tested in 2019: 35,713
- 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 2020: 6,297**
  - -246.0% change from 2019
  - Total Number of Mosquitoes Tested in 2019: 21,819
  - 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 2020: 13,884**
  - -0.1% change from 2019
  - Total Number of Mosquitoes Tested in 2019: 13894
  - 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 2020: 32,197**
  - -64.0% change from 2019
  - Total Number of Non-submitted Mosquitoes 2019: 91,294
  - 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 2020: 11,205**
  - -79.4% change from 2019
  - Total Number of Non-submitted Mosquitoes 2019: 54,363
  - 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 2020: 20,992**
  - -42.3% change from 2019
  - Total Number of Non-submitted Mosquitoes in 2019: 36,391
  - Total Number of Non-submitted Mosquitoes in 2018: 22,369
  - Total Number of Non-submitted Mosquitoes in 2017: 16,679

West Nile virus isolations 2020: 12

- **47% lower than 10-year average**
- **11 samples of *Culex pipiens/restuans* complex collected from gravid traps**
- **1 sample of *Culiseta melanura* collected from CDC light trap, late season**
- **1 human case of West Nile reported by MA DPH in Bristol County**

- WNV 2019: 14
  - 1 human case of West Nile reported by MA DPH in Bristol County
- WNV 2018: 62
- WNV 2017:15
- WNV 2016: 8
- WNV 2015: 14

Eastern equine encephalitis (EEE) virus isolations 2020: 0

- 2019: 160
  - Worst year for EEE activity in previous 15 years
  - 3 human cases of EEE with 2 fatalities, 1 non-human mammal case
- 2018: 0
- 2017: 1
- 2016: 0
- 2015: 0
- 2014: 15
- 2013: 29 samples
- 2012: 100 samples (2nd highest EEV activity in past 10 years)

Mosquito activity/trends for the 2020 Season

Following the severe outbreak of EEEv in 2019, we had been preparing for another high virus season. Part of our preparedness included expanding aerial larvicide areas and methods into the

Bolton Swamp on the Freetown/New Bedford border (Figure 1). Mosquito control efforts were greatly enhanced by a persistent drought in Bristol County which lasted from May until the end of the 2020 season. Low precipitation in the fall of 2019 probably contributed to low *Culiseta melanura* and *Coquillettidia perturbans* populations in the 2020 season.

Climate is a prime driver of mosquito populations. Drier years limit the amount of standing water for mosquito breeding in floodplains and other natural areas, but may increase breeding in domestic areas such as bird baths and planter dishes as people water more often. This seems to be the case this year as precipitation dropped by 21.6% from 2019 and observed mosquito population dropped by 60% (Table 1 and Table 4).

Bristol County went into 2020 a little drier than previous years, with annual precipitation for 2019 a little low, ranging from -1.4 inches in Taunton to -4.5 inches in New Bedford. This lack of precipitation did not recover until spring 2020, but the county was back in a dry condition by May. Drought conditions continued through the season.

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.

Typically, drier years tend to produce more *Culex pipiens/restuans* species, which are a driver of Wet Nile virus. This was found to be the case in 2020, with all species in decline from 2019 except *Culex* and *Aedes* (Figure 3).

Aerial larvicide, spring 2020

We conducted two separate aerial larvicide events in spring 2020. The first was a liquid Bti application over a large area, the second was a small-scale pelletized methoprene application over selected areas to control *Culiseta melanura*, a primary driver of Eastern Equine Encephalitis.

The 2020 aerial Bti larvicide event was completed between 4/22 and 4/29/2019. Plymouth County MCP aircraft deposited 370 gallons of VectoBac 12AS liquid larvicide, applied at a rate of 1.02 pints per acre for a total area of 2896 acres. Treated area 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 four of the eight treatment areas and at P<0.10 at seven of the eight treatment areas (Table 3). Both Abbott's and Henderson-Tilton tests show decreases in larval abundance at all sites. However, both the Abbott's and Henderson-Tilton tests are strongest when larvae are confined, something which is not practicable in our area.

To control the EEEv vector species *Cs. melanura,* a small-scale application of granular methoprene was applied on 5/11/2020. This covered 301 acres in the Hockomock and 52 acres in the Bolton Swamp at a rate of 5 lbs./acre. Control of *Cs. melanura* is difficult because of the complex larval habitat where the insect develops in water filled cavities under certain evergreen trees in very dense swamps. The effort was intended as an experiment to see if larvicide could be delivered through the evergreen canopy and down into the larval habitat. BCMCP had several partners in this effort, including Plymouth County MCP, MDAR's Pesticide Analysis Laboratory and the Northeast Center for Vector-Borne Disease at Cornell University. At the time of this report, results of this study are being analyzed and we hope to publish by spring 2021.

Arbovirus activity, summer 2020

2020 was notable for the lack of Eastern equine encephalitis virus (EEEv) detected in the county, even as activity continued in neighboring Plymouth County (Figure 7). As the typical EEEv cycle lasts for ~3 years, we should have seen some activity this year. Very likely it was this year's severe drought conditions that limited EEEv vectors in our area.

As dry years tend to produce more West Nile virus (WNV) positive mosquitoes, much of our attention was focused on habitats that support that virus. The first detections of WNV in *Culex pipiens/restuans* occurred in Attleboro during week 31, the first week of August. Detections of WNV continued in *Cx. pipiens/restuans* for the remainder of the year, with one late-season detection in *Culiseta melanura*. Overall, the WNV detected in Bristol County was about half of the 10-year average.

At the end of the 2020 surveillance season, 2 cities and towns of Bristol County have been placed at moderate risk due to their proximity to EEEv detections and cases in Plymouth County. These towns are Taunton and Raynham (Figure 7). For WNV, only 5 cities and towns in Bristol County

are reported by MA DPH to be in the Moderate Risk category (Figure 8). These towns are Attleboro, Dighton, Fall River, Somerset, and Swansea.

Aerial Adulticide, Plymouth County

High numbers of positive EEE samples in *Cs. melanura* and mammal-biting vectors in Plymouth County led to a decision to make an aerial application of Anvil 10+10 ULV adulticide over affected areas on August 10th. Some of this aerial application occurred over the eastern edges of the towns of Taunton, Raynham, and Easton in Bristol County (Figure 9). BCMCP assisted MA DPH in collecting data for their efficacy testing.

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.

BCMCP set 141 ovitraps over the 15-week season across the South Coast in potential *Ae albopictus* habitat. 46 papers from sites with presence of mosquito eggs were sent to the MA DPH insectary; of these, 10 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 0.48, 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 increased slightly from previous year's R^2 of 0.39 in 2019, but still below 0.64 in 2018, 0.78 in 2017 and 2016's 0.89. This is showing that although *Ae. albopictus* has gained a little this year, we are still 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 as well as larvicidal treatments in Acushnet and North New Bedford as detections warranted. An increase in the abundance of *Ae albopictus* was observed late in the season.

Requests for service

Bristol County MCP received 12,857 calls for service in 2020. Call numbers were +2.4% higher than the previous year. We remain around 6% below the 10-year average and +4.5% above the 5-year average. 97.65% of all requests were completed, the uncompleted requests were generally too close to listed pesticide exclusion areas to treat safely. BCMCP stopped taking residential requests as of 9/4/20 and stopped ULV spray activities as of 9/11/20. In the past 5 years, Bristol has received 15,133 calls for service in 2015, 12,237 in 2016, 11,150 in 2017, 10,444 in 2018 and 12,550 calls in 2019. We have looked into weather patterns and mosquito abundance as drivers of fluctuating request numbers, but there does not seem to be any relationship.

Bristol County Mosquito Control Project's Outreach Program:

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 a few activities with local groups in early spring, but all outreach activities for the year had been postponed indefinitely due to the covid-19 pandemic by mid-March.

Coordination between BCMCP and the local Boards of Health was ongoing relative to control/surveillance options in the vicinity of WNV positive mosquito samples and high mosquito collections. Even though Labor Day is the unofficial end of summer, BCMCP continued to alert the public that the seasonality of mosquito borne disease continues until the first frost in fall. 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- Combined Bristol County mosquito data, 2016 to 2020

	2016	***2017***	***2018***	***2019***	***2020***
Total samples	*604*	*804*	*865*	*1060*	*649*
Total mosquitoes tested	*15877*	*23187*	*26960*	*35713*	*20181*
Total mosquitoes not tested	*20699*	*23518*	*31786*	*91294*	*32197*
Total mosquitoes captured	*35576*	*46705*	*58746*	*127007*	*52378*
Number of adult mosquito traps set	*ND*	*ND*	*614*	*676*	*597*

Table 2- Towns and number of West Nile virus (WNV) positive samples in 2020.

Town	***WNV+ Samples***
Attleboro	5
Easton	1
Fall River	1
North Attleborough	1
Norton	1
Somerset	3
Grand Total	**12**

Table 3. Statistical tests on pre- and post- treatment data for Bti aerial larvicide in Bristol County April, 2020. Asterisks indicate statistical significance (t-test, P<0.05).

	Location	*Abbott's Rule*	*Henderson-Tilton*	*t-Test (P<0.05)*
Hockomock section	Control- Dead East 1	3.86	-43.21	0.82
	Control- Dead East 2	-64.71		0.35
	Hockomock 1	-99.00		0.03
	Hockomock 2	-93.29		0.02
	Hockomock 3	-41.86		0.00
	Hockomock 4	-41.86		0.13
Bolton section	Control- Bolton 1	31.00	-30.39	0.79
	Control- Bolton 2	41.00		0.89
	Bolton 3	-89.00		0.07
	Bolton 4	-49.00		0.07
	Bolton 5	-79.00		0.03
	Bolton 6	-59.00		0.10

Table 4- Bristol county area average temperature, precipitation totals in inches and deviation from norm as of 12/31/20 (NOAA 2020)

	New Bedford	*Providence*	*Taunton*	*Area average*
Precipitation total (in)	26.59	44.71	41.8	37.7
Deviation from normal	-45%	-5%	-16%	-22%
Change from previous year	-39%	-13.7%	-16.4%	-21.6%
Temperature average (F)	52.4	54.0	52.4	52.93
Deviation from normal	+102%	+103%	+103%	+103%
Change from previous year	+104%	+104%	+103%	+104%

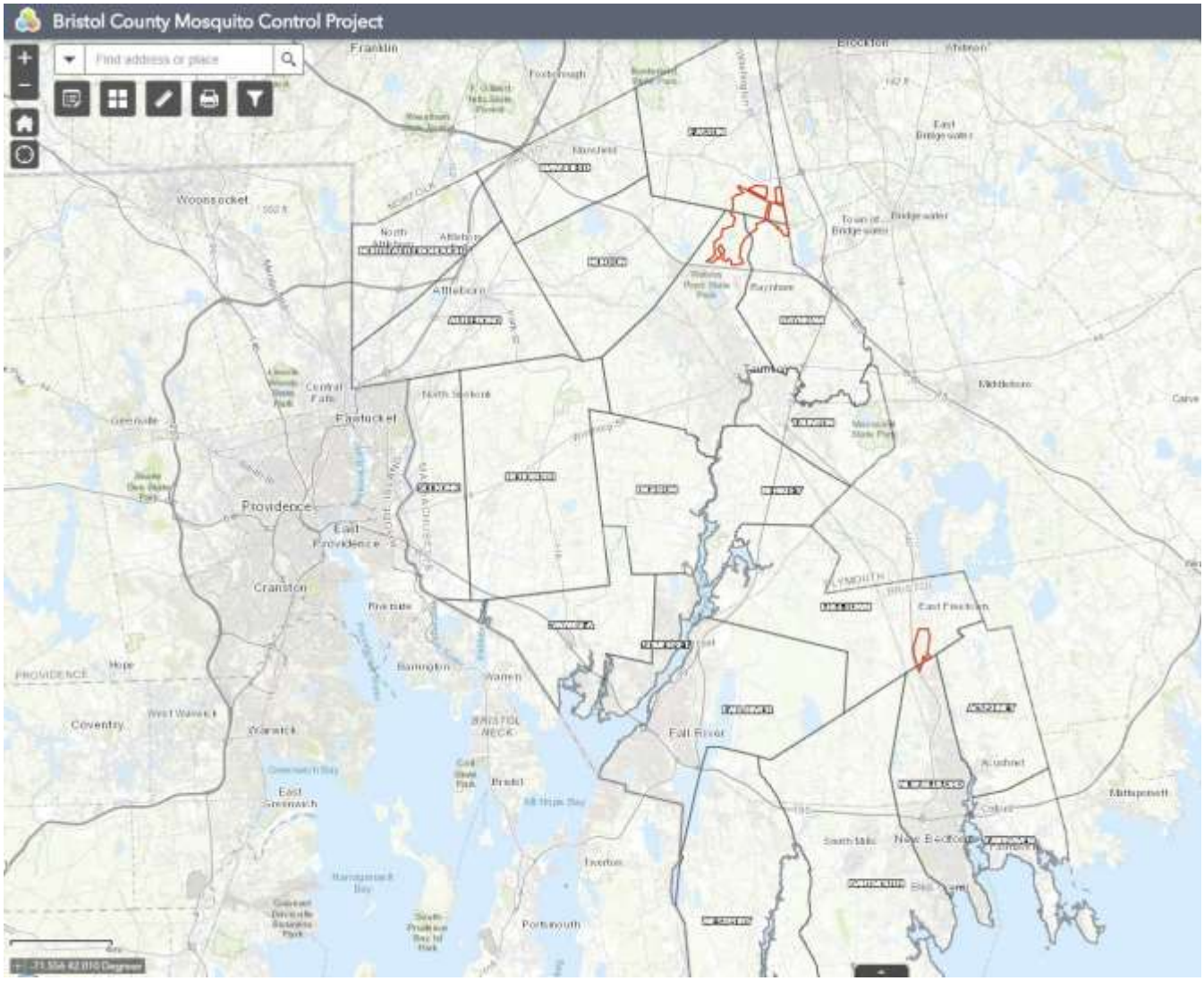


Figure 1. ArcGIS map of aerial Bti treated areas April, 2020.

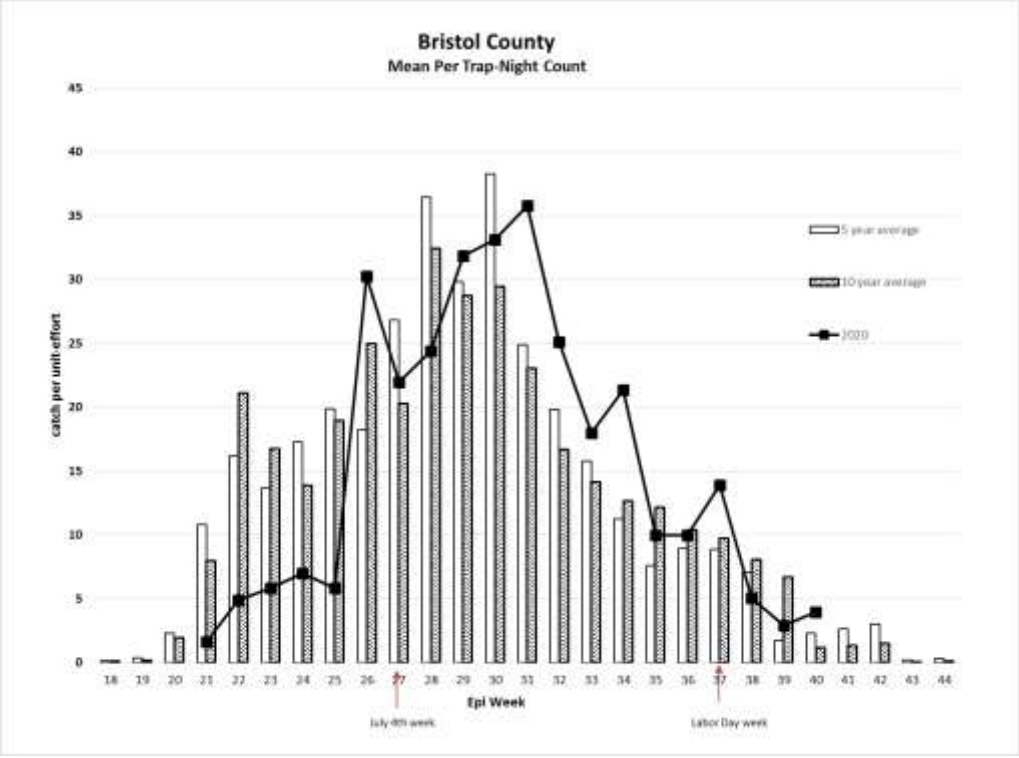


Figure 2- 2020 population totals per trap-night by epi week compared to 5- and 10-year average. The population dip at week 27 is an artifact of reduced trapping due to the July 4th holiday week.

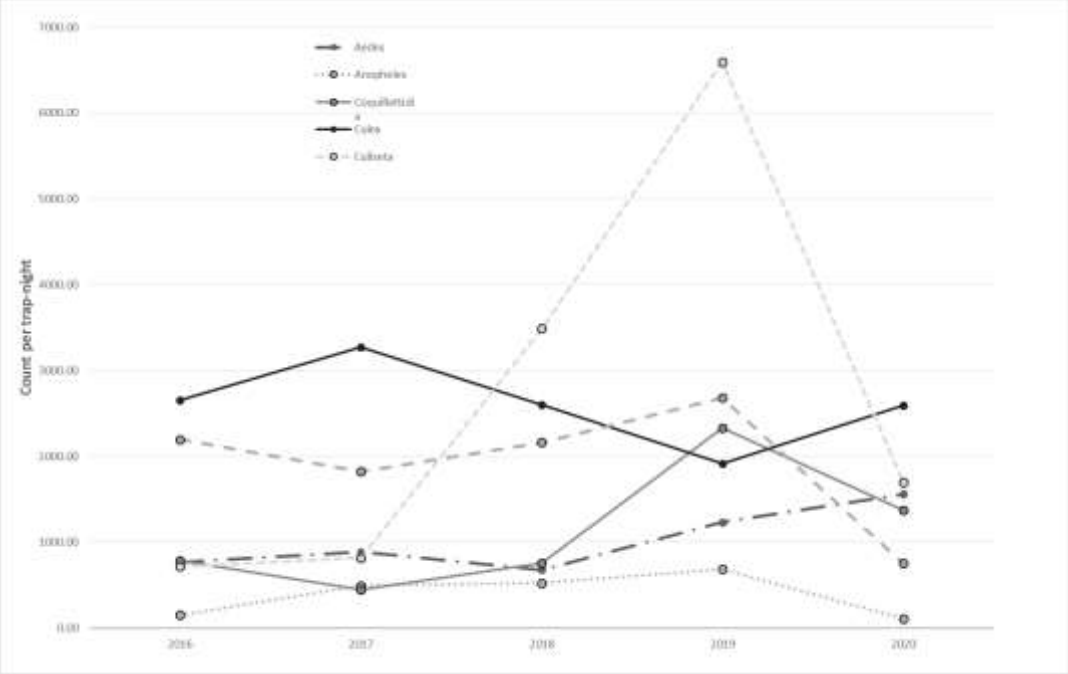


Figure 3- Mean number of observed mosquitoes by genus captured per trap-night by BCMCP and MA DPH in Bristol County, MA 2016 to 2020.

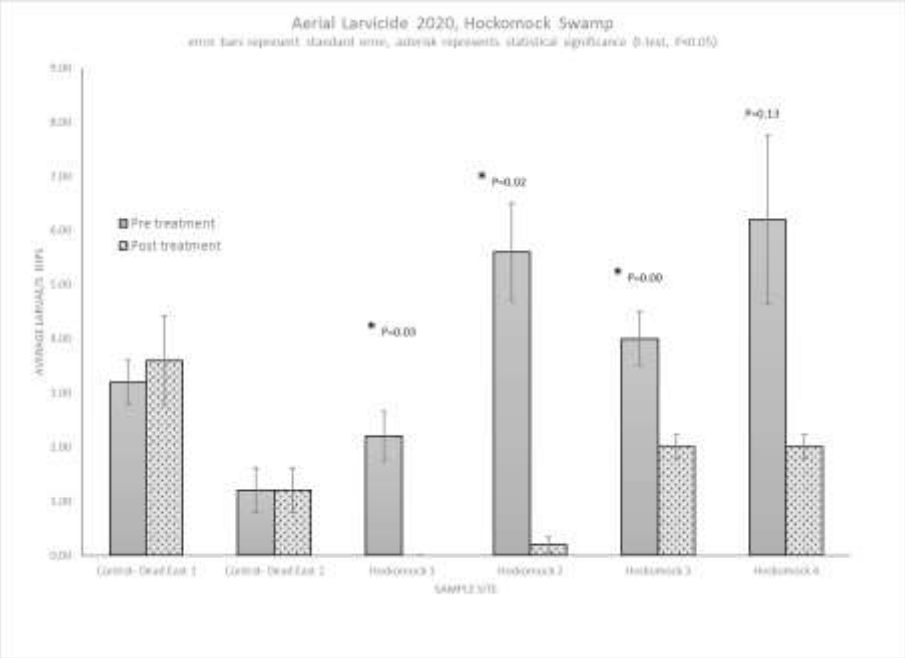


Figure 4- Pre- and post-treatment larval populations in the Hockomock and Dead Swamps April 2020. Error bars represent standard error, asterisks denote statistical significance (t-test, P<0.05).

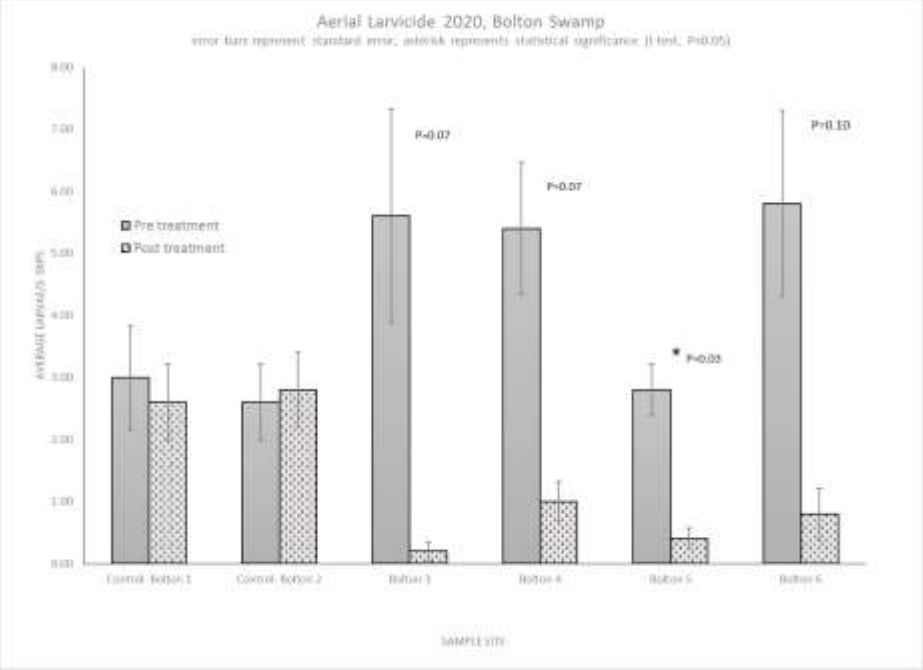


Figure 5- Pre- and post-treatment larval populations in the Bolton Swamp, April 2020. Error bars represent standard error, asterisks denote statistical significance (t-test, P<0.05).

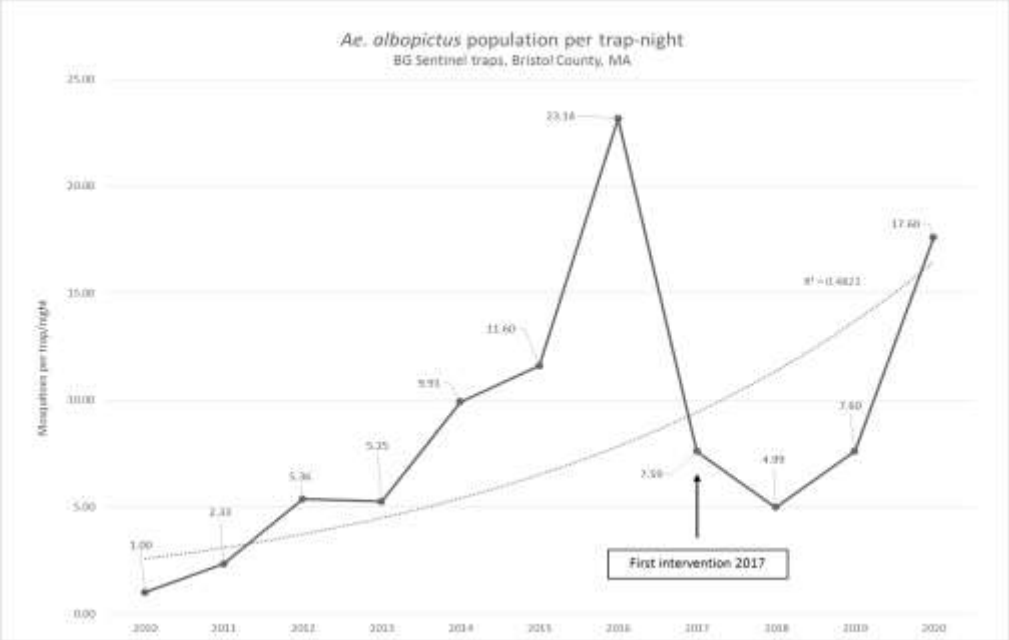


Figure 6- Population increase for Asian tiger mosquitoes in BG Sentinel traps in New Bedford, 2009-2020. Data normalized to decrease effects of increased trap effort.

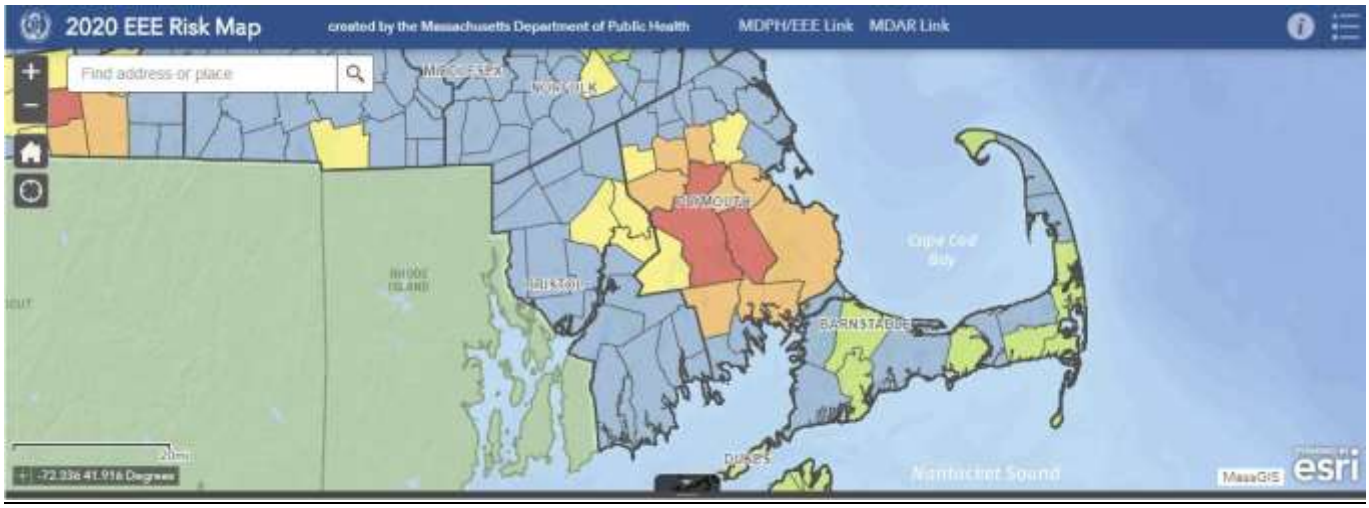


Figure 7- Massachusetts Dept. of Public Health Eastern Equine Encephalitis virus risk map for the end of the 2020 season. https://www.mass.gov/info-details/massachusetts-arbovirus-update Retrieved 11/24/20.

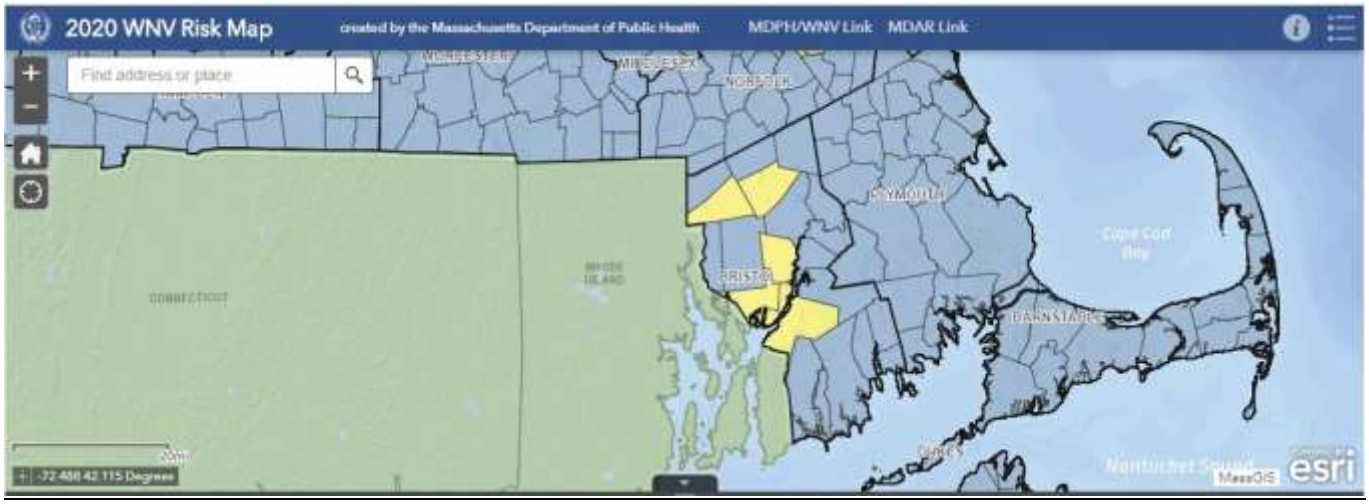


Figure 8- Massachusetts Dept. of Public Health West Nile virus risk map for the end of the 2019 season. https://www.mass.gov/info-details/massachusetts-arbovirus-update Retrieved 11/24/20.

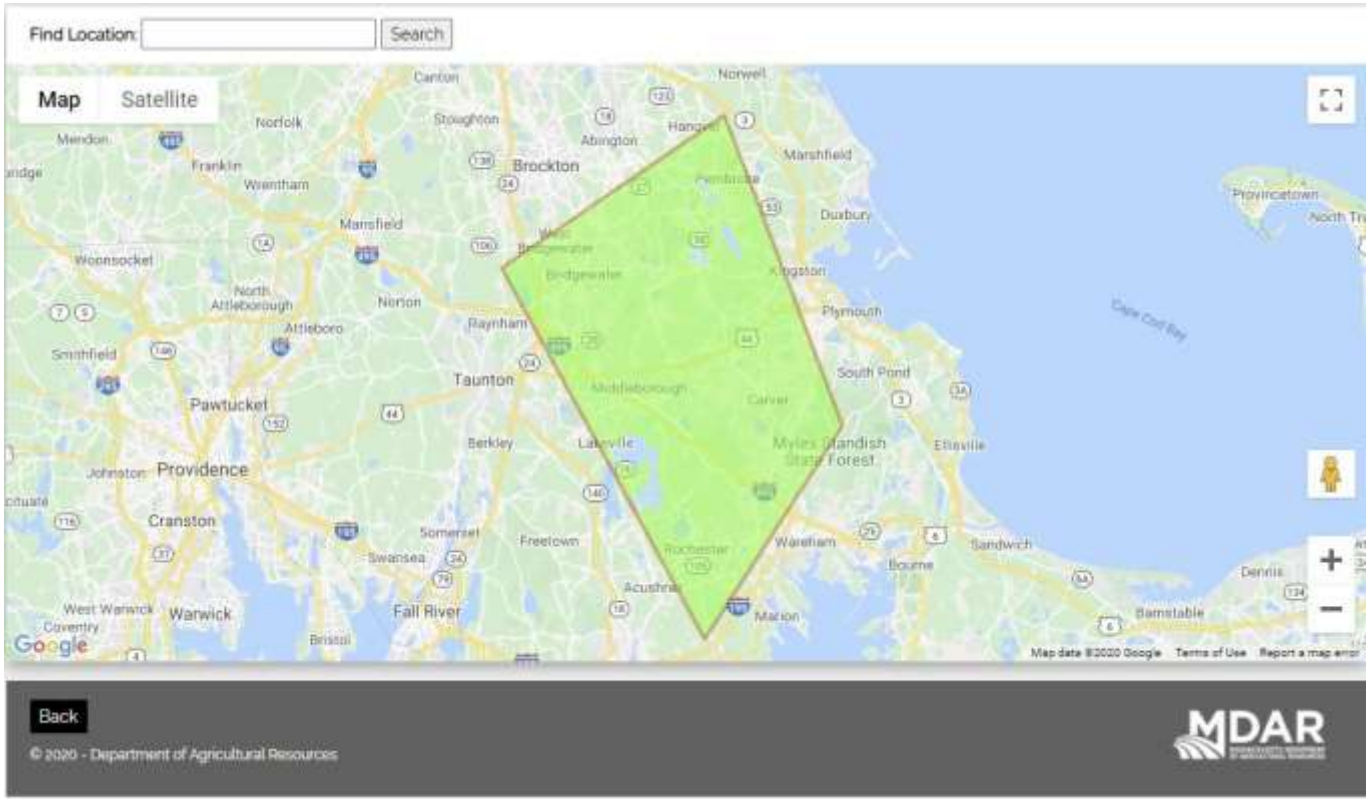


Figure 9- Area treated during the Plymouth County aerial adulticide event, August 10, 2020. https://massnrc.org/spray-map/Region/Map/1026 Retrieved 11/24/20.

Project Name: Bristol County Mosquito Control Project
FY2021 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	2.63%	$43,093	$1,843	$44,936
ATTLEBORO	6.23%	102,102	4,372	$106,474
BERKLEY	2.19%	35,916	1,536	$37,452
DARTMOUTH	10.23%	167,796	7,178	$174,974
DIGHTON	2.83%	46,339	1,982	$48,321
EASTON	5.44%	89,162	3,814	$92,976
FAIRHAVEN	2.86%	46,833	2,003	$48,836
FALL RIVER	7.23%	118,638	5,075	$123,713
FREETOWN	4.42%	72,521	3,102	$75,623
MANSFIELD	4.89%	80,231	3,432	$83,663
NEW BEDFORD	6.66%	109,209	4,672	$113,881
NORTH ATTLEBORO	4.87%	79,941	3,420	$83,361
NORTON	4.59%	75,209	3,217	$78,426
RAYNHAM	3.64%	59,723	2,555	$62,278
REHOBOTH	5.67%	92,952	3,976	$96,928
SEEKONK	3.59%	58,887	2,519	$61,406
SOMERSET	2.52%	41,378	1,770	$43,148
SWANSEA	3.86%	63,361	2,710	$66,071
TAUNTON	8.44%	138,338	5,918	$144,256
WESTPORT	7.21%	118,205	5,057	$123,262

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

(*Updated: 5/17/17)*

Figure 7.

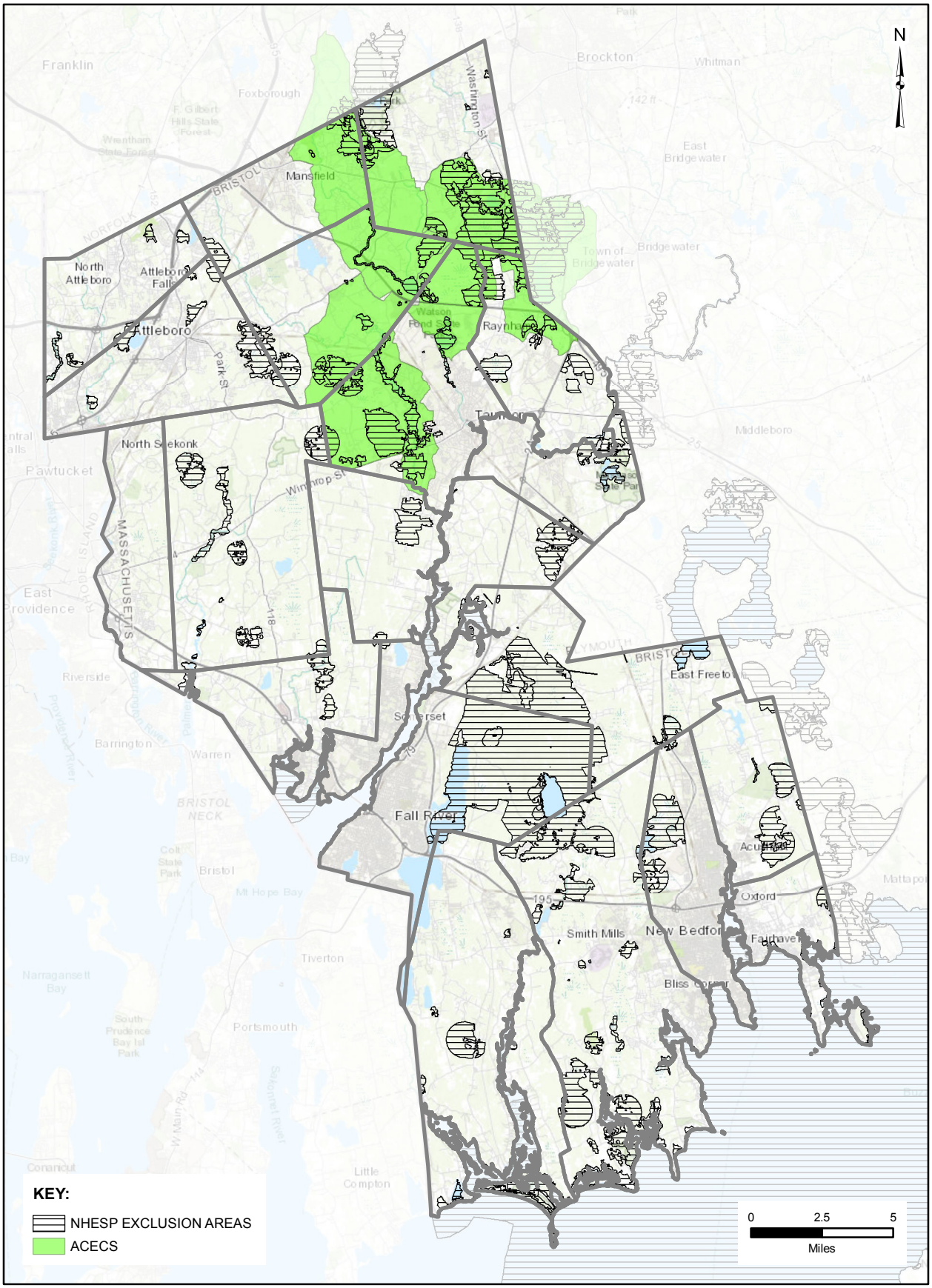


Figure 8. Exclusion Areas

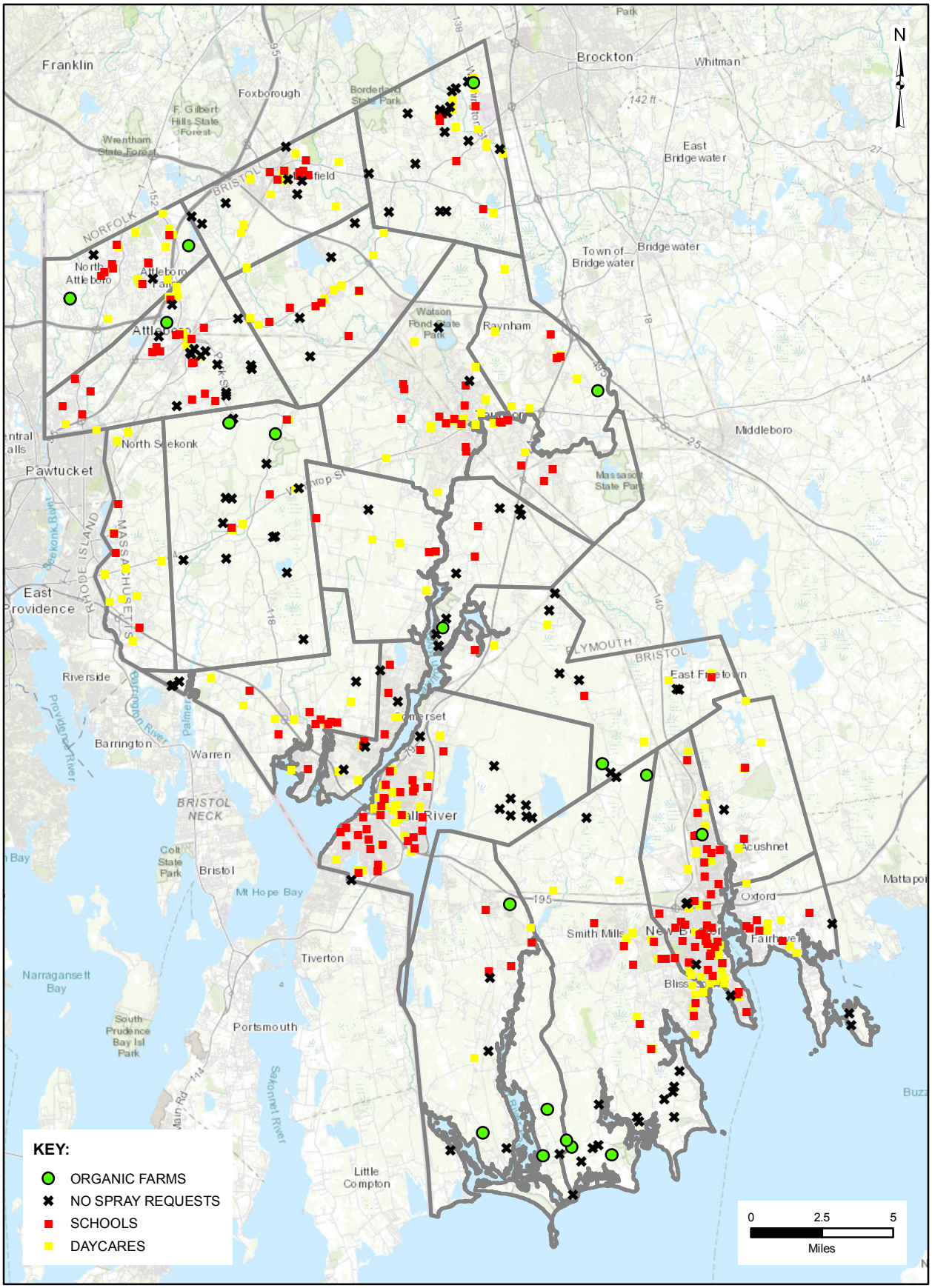


Figure 9. No Sprays