

Of the above, how many are:

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

- Administrative Ross Rossetti, Matthew McPhee, Denise Deluca
- Biologist
- Educator Cathleen Drinan, Ellen Bidlack
- Entomologist Ellen Bidlack
- Facilities Matthew McPhee, Russell Mazzilli
- Information technology Ellen Bidlack, Ross Rossetti
- Laboratory Ellen Bidlack
- Operations Ross Rossetti, Matthew McPhee, Russell Mazzilli
- Public relations Cathleen Drinan
- Wetland scientist
- Other (please describe) Pilot-Ross Rossetti, Excavator Operator-Brian Callahan, Brandon Gillett, General Foreman - Russell Mazzilli, Field Technicians - Christopher Hanna, George Rego, Michael Wilkins, Christopher Hoppie, Stephanie Dugan, Brett Sousa

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

- 1 Modified wetland equipment (list type) Link-Belt Excavator
- 12 Larval control equipment (list type) A-1 Mist Sprayer, hydraulic sprayer, backpack sprayers, pump can
- 9 ULV sprayers (list type) Clarke Pro Mist Dura
- 20 Vehicles

Other (please be specific): 1 John Deere 35G mini excavator, 1 John Deere 323E Compact Track Loader, 1 Mustang Skid-steer, 1 Cessna AG Wagon w/boom nozzle & grandular spreader

Comments: _____

How many cities and towns are in your service area?* 28

Alphabetical list: Abington, Bridgewater, Brockton, Carver, Cohasset, Duxbury, East Bridgewater, Halifax, Hanover, Hanson, Hingham, Hull, Kingston, Lakeville, Marion, Marshfield, Mattapoisett, Middleboro, Norwell, Pembroke, Plymouth, Plympton, Rochester, Rockland, Scituate, Wareham, West Bridgewater, Whitman

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): Pesticide resistance testing**

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 larvae from maturing into adults. The Project treats stagnant water with larvae by airplane, truck mounted sprayers, backpack blowers, and by hand. The Project larvicides over 12,000 acres and treats between 50 and 60 thousand catch basins per year.

What months is this program active? Spring and Summer months

Describe the types of areas where you use this program: A variety of fresh water wetland, salt marshes, drainage basins, and stagnant water within the district.

Do you use:

- Ground application (hand, portable and/or backpack, etc.)**
- Aerial applications**
- Other (please list): A-1 Mist Sprayer, hydraulic sprayer**

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
Vectobac 12AS	73049-38	1 pint per acre	Aerial	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	1,193 gals.
Vectobac 12AS	73049-38	5oz to 50gals water	Hydraulic Sprayer	Larvae	<input type="checkbox"/> Catch basins <input checked="" type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	67.8 gals.
Four Star 90 Day Briquet	83362-3	1 Briquet per 100 sq. feet surface area	Hand	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	26 lbs.
Summit Briquets	6218-47	1briquet /10'x10' surface area	Hand	Larvae	<input type="checkbox"/> Catch basins <input checked="" type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	84.3 lbs.
VectoLex WSP	73049-20	1 pouch per basin	Hand	Larvae	<input checked="" type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	423 lbs.
VectoMax	73049-429	1 pouch per basin	Hand	Larvae	<input checked="" type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	766 lbs.
Four Star MBG	85685-3	5-10 lbs. per acre	Backpack	Larvae	<input type="checkbox"/> Catch basins <input checked="" type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	129 lbs.

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
Four Star 45 Day Briquete	83362-3	1 Briquet per 100 sq. feet surface area	Hand	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	120 lbs.
BVA 2 Larvacide Oil	70589-1	1-5 Gallons per acre depending on vegetation	Wand Sprayer	Larvae/pupae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	755.7 oz.
Vectolex WDG	73049-57	.5-1.5 lbs/acre	Hydraulic Sprayer	Larvae	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	93.6 lbs.
Vectobac DT	73049-447	1 Tablet per 13.2 gallons	Hand	Larvae	<input checked="" type="checkbox"/> Catch basins <input checked="" type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	12.31 grams
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	
				Choose one	<input type="checkbox"/> Catch basins <input type="checkbox"/> Containers <input type="checkbox"/> Wetland <input type="checkbox"/> Other (please list):	

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

- Best professional judgment
- Historical records
- Larval dip counts – please list trigger for application: Refer to GEIR Table 17
- Other (please describe):

Comments: _____

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

<http://www.plymouthmosquito.org/service-area.html>

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: The goal of our program is to reduce the number of biting mosquitoes to protect human health and improve the quality of life of our residents. The Project takes residential, business, and town official requests for adulticiding with ULV truck mounted sprayers.

What is the time frame for this program? June to September (end date depends on virus activity and weather conditions).

Describe the types of areas where you use this program: Streets, Fields, Schools (per Children's Protection Act regs), yards, recreation areas.

Do you use:

- Aerial applications
- Portable applications
- Truck applications
- Other (please list): Hydraulic Sprayer, A-1 Mist Blower

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	.62oz.per acre	ULV	301.9 Gals
Zenivex	2724-807	.75oz.per acre	ULV	150.4 Gals

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

Each resident household has a maximum of 8 treatments per season.

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

- Arbovirus data
- Best professional judgment
- Complaint calls (Describe trigger for application: 2 per geographical area)
- Landing rates (Describe trigger for application)
- Light trap data (Describe trigger for application 5 per night))

Comments: _____

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

<http://www.plymouthmosquito.org/service-area.html>

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: We often inspect properties and offer advice to landowners regarding actions they can take to reduce the amount of mosquito production on their property. We currently run a tire removal program year round. This year we removed 562 tires for recycling.

What time frame during the year is this method employed? Throughout the year

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: The project's water management program is conducted pursuant of chapter 252 of the MA General Laws and is compliant with US Army Corps guidance. The goal of the program is to maintain existing drainage in order to reduce the amount of flooding and stagnant water in the district. This kind of work can reduce the amount of pesticide used and the number of mosquitoes in the area. We seek to use the least impactful methods to maintain these waterways. Techniques include site monitoring both before and after work, hand cleaning of ditches or use of mechanized equipment.

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

Maintenance Type	Estimate of cumulative length of culverts, ditches, swales, etc. maintained (ft)
<input type="checkbox"/> Culvert cleaning	
<input checked="" type="checkbox"/> Hand cleaning	87,957 Ft
<input checked="" type="checkbox"/> Mechanized cleaning	5,535 Ft

<input type="checkbox"/> Stream flow improvement	
<input type="checkbox"/> Other (please list):	

Comments: _____

For saltmarsh ditch maintenance, check off all that apply:

Maintenance Type	Estimate of cumulative length of ditches maintained (ft)
<input type="checkbox"/> Hand cleaning	
<input checked="" type="checkbox"/> Mechanized cleaning	1,090 Ft
<input type="checkbox"/> Other (please list):	

Comments: _____

What time frame during the year is this method employed? Jan-Dec

Comments: _____

Please attach a map of ditch maintenance areas (or a website link to that map).

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: OMWM aims to protect the salt marsh from the adverse impacts of grid ditching and improve the ecosystem. OMWM utilizes the natural features of the salt marsh to enhance predatory fish and native bird habitat while reducing or eliminating stagnant areas that are conducive to mosquito larval development.

What months is this program active? This method is not in use due to current restrictive regulations as well as possible negative impacts to the salt marsh when combined with sea level rise.

Please give an estimate of total square feet or acreage: 0

Comments: We obtained all our permits for this program 2017.

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:	Pre and Post applications
Ground ULV Adulticide:	Trapping data and Service Requests
Larvicide – catch basins:	prior to application

Larvicide-hand/small area prior to application
 Open Marsh Water Management: Pre and Post application and per permit
 Source Reduction: Pre and Post applications
 Other (please list):

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

Per established Mass. Best Management Practice Standards and State Reclamation and Mosquito Board G.E.I.R.

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

Research Project	Details
Bottle assays	Used the CDC's bottle assay to test for pesticide resistance in adult mosquitoes. We also collaborated with the Northeast Regional Center for Excellence in Vector Borne Diseases to test additional mosquitoes. The center is located at Cornell University.
Efficacy testing	
Other:	
Other:	

ADULT MOSQUITO SURVEILLANCE

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

Describe the purpose of this program: The purpose of this program is three fold: to monitor the mosquitoes for diseases, to determine general population levels and to decide where we can better focus our larvaciding and adulticiding efforts.

What months is this program active? May-October

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)
<input type="checkbox"/> ABC light trap	<input type="checkbox"/>	
<input type="checkbox"/> ABC light trap w/CO ₂	<input type="checkbox"/>	
<input type="checkbox"/> CDC light trap	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CDC light trap w/CO ₂	<input type="checkbox"/>	26
<input checked="" type="checkbox"/> Gravid trap		24
<input type="checkbox"/> Landing rate test		
<input checked="" type="checkbox"/> NJ light trap	<input type="checkbox"/>	28
<input type="checkbox"/> NJ light trap w/CO ₂	<input type="checkbox"/>	
<input checked="" type="checkbox"/> Ovitrap		7

<input type="checkbox"/> Resting box		
<input type="checkbox"/> Other (please describe):		
<input type="checkbox"/> Other (please describe):		
<input type="checkbox"/> Other (please describe):		

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

If yes, how many:

28 - NJ trap sites, 16 - CDC trap sites, and 15 - Gravid trap sites

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

- | | |
|--|---|
| <input checked="" type="checkbox"/> <i>Ae. albopictus</i> | <input checked="" type="checkbox"/> <i>Oc. abserratus</i> |
| <input checked="" type="checkbox"/> <i>Ae. cinereus</i> | <input checked="" type="checkbox"/> <i>Oc. canadensis</i> |
| <input checked="" type="checkbox"/> <i>Ae. vexans</i> | <input checked="" type="checkbox"/> <i>Oc. cantator</i> |
| <input checked="" type="checkbox"/> <i>An. punctipennis</i> | <input checked="" type="checkbox"/> <i>Oc. j. japonicus</i> |
| <input checked="" type="checkbox"/> <i>An. quadrimaculatus</i> | <input checked="" type="checkbox"/> <i>Oc. sollicitans</i> |
| <input checked="" type="checkbox"/> <i>Cq. perturbans</i> | <input checked="" type="checkbox"/> <i>Oc. taeniorhynchus</i> |
| <input checked="" type="checkbox"/> <i>Cx. pipiens</i> | <input checked="" type="checkbox"/> <i>Oc. triseriatus</i> |
| <input checked="" type="checkbox"/> <i>Cx. restuans</i> | <input checked="" type="checkbox"/> <i>Oc. trivittatus</i> |
| <input checked="" type="checkbox"/> <i>Cx. salinarius</i> | <input checked="" type="checkbox"/> <i>Ps. ferox</i> |
| <input checked="" type="checkbox"/> <i>Cs. melanura</i> | <input type="checkbox"/> <i>Ur. sapphirina</i> |
| <input type="checkbox"/> <i>Cs. morsitans</i> | |
| <input type="checkbox"/> Others (please list): | |

Number of adult mosquitoes collected this season (whether submitted to DPH or not): 130,063

Number of adult mosquito pools collected this season (submitted and unsubmitted): 1,965

Number of ovitrap collections this season, if any: 32

Any other trap collections of note (please describe): Extra trapping was done to collect mosquitoes for pesticide resistance testing.

Do you participate in the MDPH Arboviral Surveillance program? Yes

Total number of adult mosquito pools submitted to DPH this past season: 503

How many pools do you submit weekly on average? 28

Number of traps in your service area **placed by MDPH**: 5

Were these long-term trap sites or supplemental trapping sites? long-term

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

Arbovirus	Positive Mosquito Pools	Equine Cases	Human Cases
<input type="checkbox"/> Eastern Equine Encephalitis (EEE)	0	0	0
<input checked="" type="checkbox"/> West Nile Virus (WNV)	6	0	0
<input type="checkbox"/> Other (please list):			

Comments: _____

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

Arbovirus	Start of Season	End of Season
EEE	all towns at remote risk	all towns at remote risk
WNV	all towns at low risk	all towns at low risk except Bridgewater, East Bridgewater, Hanson, Halifax and Plympton which were at moderate risk

Comments: _____

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: The over-arching purpose of the program is to enhance public health and safety of the residents of Project communities as it applies to mosquitoes and mosquito viruses. The Project employs all the methods checked on the form to reach individuals and groups of people of all ages in our member communities and to communicate the messages of the Massachusetts Department of Public Health, The Centers for Disease Control, the Environmental Protection Agency, and the American Mosquito Control Association.

What time frame during the year is this method employed? Primarily April through October, but requests may take place any time of the year. The time period of November - March is generally a time for planning the focus of the next season's efforts.

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): _____

Estimate the audience reached this year using the education/outreach methods above: In-person and zoom events- 1,000-2,000. Radio/TV/website/Facebook/Newspaper- 100,000+
Comments:

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

1. School/Summer Camp in-person presentations
2. Marshfield Fair
3. Social Media Outreach

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 Cornell University
- Another mosquito control district/project BCMCP
- Another state agency (DCR, DPH, etc.) CT Agricultural Experiment Station
- Environmental groups
- Industry

List any training/education your staff received this year: Applicators License Training, NMCA Annual Meeting, Hoisting License Continuing Ed., Mosquito Identification Training, NAAA Convention

Please list the certifications and degrees held by your staff: Ellen Bidlack B.S., M.A. Entomology, Commercial Certification 47, Hoisting License 1c2a - Ross Rossetti B.S. Aviation Science, CORE Management Program, Commercial Pilots/Drone Certificate, Commercial Applicator Certification 47 and 34, Hoisting license 1c2a, Class A CDL - Brain Callahan Commercial Applicator Certification 47, Class A CDL, 1c2a Hoisting License - Brandon Gillett Commercial Applicator Certification 47, 1c2a Hoisting License, Class A CDL - Christopher Hanna Commercial Applicator Certification 47, 2a Hoisting License - George Rego Applicators License, Class A CDL, 1c2a Hoisting License - Matthew McPhee B.A. Earth, Environment and Oceanic Sciences, CORE Management Program, Commercial Applicator Certification 47, 1c2a Hoisting License, Class A CDL - Russell Mazzilli B.S. Criminal Justice, Commercial Applicator Certification 47, Class A CDL, Hoisting License 1c2a - Michael Wilkins Commercial Applicator Certification 47, Hoisting License 1c2a - Stephanie Dugan, B.S. Environmental Biology, Commercial Applicator Certification 47, Hoisting License 1c2a - Christopher Hoppie Applicator License - Brett Sousa B.S. Criminal Justice, Applicator License, Hoisting License 1c2a.

Comments: _____

INFORMATION TECHNOLOGY (IT)

Does your program use (check all that apply):

- Aerial Photography
- Databases
- Dataloggers (monitoring for temperature, etc.)
- GIS mapping (Describe: Site planning, exclusion mapping, larvicide/adulticide tracking)
- GPS equipment
- Smartphones
- Tablets/Toughbooks
- Other (please describe):

Describe any changes/enhancements in IT from the previous year: PCMCP has migrated to cloud based Field Seeker for managing surveillance data, pesticide applications, and water

management activities. Windows ULV is now used to track adulticide applications. The Project server has been upgraded.

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

Comments: _____

REVENUES & EXPENDITURES

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

	Date of Fiscal Year	Approved Budget	Notes
Previous	FY21	1,991,602.00	
Current	FY22	2,041,392.00	
Future	FY23	2,082,219.84	Not approved at this time

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):

<https://dlsgateway.dor.state.ma.us/reports/rdPage.aspx?rdReport=CherrySheets.CSbyProgMunis.MuniBudgFinal>

Comments: _____

SERVICE REQUESTS

How many service requests did you receive this season? 16,852

How many were for larviciding? 515

How many were for adulticiding? 16,337

Was this an increase or decrease over last season? Decrease

Comments: Larval requests increased over last year while adulticide decreased.

EXCLUSIONS

How many exclusion requests did you receive this season? 465

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. There was 24,209 acres excluded from adulticiding activities in 2021. Natural Heritage and Endangered Species Program placed limitations on an additional 13,846 acres.

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:

- 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: We continually work with local DPW and MassDOT on water management projects.

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

Describe: We work with DPW's and MassDOT to identify areas with need for ongoing maintenance.

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

Describe: In 2020 we conducted a joint research project with BCMCP, Cornell University, and CT Agricultural Experiment Station to examine the efficacy of methoprene applications against *Culiseta melanura*. In 2021 the collaboration concluded with the publication of the paper. Burtis, J.C., J.D. Poggi, T. B. Duval, E. Bidlack, J. J. Shepard, P. Matton, R. Rossetti and L. C. Harrington. 2021. Evaluation of a methoprene aerial application for the control of *Culiseta melanura* (Diptera: Culicidae) in Wetland larval habitats. *J. of Med. Ent.* 58(6):2330-2337.

This year we continued our relationship with Cornell University. We sent them mosquitoes for pesticide resistance testing.

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

Describe:

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

Describe:

CHILDREN AND FAMILIES PROTECTION ACT (CFPA)

Is your program impacted by the CFPA? Yes

If yes, please explain: Incomplete listing of our products delays or prohibits treating for mosquitos on school property.

If you have data on compliance rates with the CFPA within your program area, please list here:
PCMCP checks IPM plans for every school before it schedules an application.

Describe any difficulties you have had with the implementation of your program due to the CFPA, please elaborate here: No problems, schools were anxious to make sure that they were in compliance with the CFPA.

Comments:

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: _____