

**MASSACHUSETTS MOSQUITO CONTROL
ANNUAL OPERATIONS REPORT**



2011 Year of Report Date of Report: 1-12-2012

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

Address: Box 72 142 R Pembroke Street

City/Town: Kingston Zip: 02364

Phone: 781-585-5450 Fax: 781-582-1276

E-mail: atexeira@plymouthmosquito.org

Report prepared by: Anthony Texeira

If you have a mission statement, please include it here: to maintain an efficient, economical mosquito control operation that will provide the best results possible, be consistent with all ecological aspects and consider the best interests of member communities.

ORGANIZATION SETUP:

Please list your Commissioner's names:

Carolyn Brennan - Chairman
John Kenny
Michael Valenti

Leighton Peck
Kimberly King

Please list the Supt./Director's name: Anthony Texeira

Please list the Supt./Director's contact phone number: 781-585-5450

Please list your Asst. Supt./Asst. Director's name:

Do you have a website? Yes

If yes, please list the web address here: <http://plymouthmosquito.org>

Please list your staffing levels for the year of this report:

Full time: 12

Part time: 1

Seasonal: 6

Other: (please describe)

Please break these down into the following areas:

Administrative staff: 3
Field staff: 16

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

- Public relations Daniel Daly
- Information technology
- Entomologist Ellen Bidlack
- Wetland Scientist
- Biologist
- Education Daniel Daly, Ellen Bidlack
- Laboratory
- Operations Jo Ann Fawcett, Steve Gillett
- Facilities Anthony Texeira, Steve Gillett
- Other (please list) Pilot & Excavator operator - Greg Goodband, Excavator operator - Brian Callahan, Field Technicians - Edward Medeiros, Dan Cabral, Richard Goodwin, Christopher Hanna and George Rego

For the year of this report, we maintained:

18 vehicles

1 modified wetland equipment (list type) Link-Belt excavator

8 ULV sprayers (list type) Beeco Mist

14 Larval control equipment (list type) 2 Hydraulic units, 2 backpack sprayers, 10 pump

Other (please be specific): 1 Link-Belt excavator

Comments: _____

How many cities & towns in your service area? 28

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

***Please attach a link to a map of your service area if possible.**

<http://www.plymouthmosquito.org/map.htm>

INTEGRATED PEST MANAGEMENT (IPM):

DEFINITION: a comprehensive strategy of pest control whose major objective is to achieve desired levels of pest control in an environmentally responsible manner by combining multiple pest control measures to reduce the need for reliance on chemical pesticides; more specifically, a combination of pest controls which addresses conditions that support pests and may include, but is not limited to, the use of monitoring techniques to determine immediate and ongoing need for pest control, increased sanitation, physical barrier methods, the use of

natural pest enemies and a judicious use of lowest risk pesticides when necessary.

Please check off all of the services that you currently provide to your member cities and towns as part of your IPM program; details of these services are in the next sections.

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

Comments: _____

LARVAL MOSQUITO CONTROL:

Do you have a larval mosquito suppression program? Yes

If yes, please 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, protecting human health and improving the quality of life of our residents

Please give the time frame for this program: April- September

Describe the areas that this program is used: We target a variety of fresh water wetlands and salt marshes

Do you use:

- Ground applied (includes hand, portable and/or backpack)
- Helicopter applications
- Other (please list): Airplane

Comments: _____

What products do you use in – (please use product name and EPA#)

Wetlands: Vectobac 12AS 73049-38, Vectolex CG 73049-20, BTI Briquets 6218-47, Altosid XR 2724-421

Catch basins: Altosid pellets 2724-448, Altosid pellets wsp

Containers:

Other (please list):

Please list the rates of application for the areas listed above:

Wetlands: Vectobac 12AS 1 pint per acre by plane

Catch basins: Altosid pellets 7 gramms per basin

Containers:

Other:

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

Larval dip counts – please list trigger for application:

Historical records

Best professional judgment

Comments: _____

***Please attach a link to maps of treatment areas if possible.**

ADULT MOSQUITO CONTROL:

Do you have an adult mosquito suppression program? Yes

If yes, please 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

Please give the time frame for this program: May - October (end date depends on virus activity and weather conditions)

Describe the areas that this program is used: Project wide PCMCP accepts requests for adult mosquito control from residents , buisnesses and town officials

Do you use:

Truck applications

Portable applications

Aerial applications

Other (please list):

Comments: _____

Please list the names of the products used with EPA #:

1). Duet 1021-1795-8329

2). Flit 10 EC 8329-67

- 3).
- 4).
- 5).
- 6).

Please list your application rates for each product:

- 1). Duet - 0.62 FL. oz/acre
- 2). Flit - 7 oz/ per gal. of water
- 3).
- 4).
- 5).
- 6).

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

Each resident has a maximum of 8 treatments per season

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

- Landing rates - please list trigger for application
- Light trap data - please list trigger for application
- Complaint calls - please list trigger for application
- Arbovirus data
- Best professional judgment

Comments: _____

***Please attach a link to maps of treatment areas if possible.**

SOURCE REDUCTION

Do you perform source reduction methods such as tire/container removal? Yes

If yes, please describe your program: Our source reduction program is comprised of our ditch maintenance program, OMWM and education. We often inspect properties and offer advice to landowners regarding actions they can take to reduce the amount of mosquito production on their property.

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

Comments: _____

DITCH MAINTENANCE

Do you have a ditch maintenance program? Yes

Please check all that apply:

- Inland/freshwater
- Saltmarsh

If yes, please describe: Hand and Mechanized Equipment

Please check off all that apply INLAND DITCH MAINTENANCE:

- Hand tools**
- Mechanized equipment**
- Other (please list):**

Comments: _____

Please check off all that apply SALTMARSH DITCH MAINTENANCE:

- Hand cleaning**
- Mechanized cleaning**
- Other (please list):**

Comments: _____

Please give an estimate of cumulative length of ditches maintained from the list above **INLAND:**

Hand cleaning 42,665 ft
Mechanized cleaning 8,490 ft
Other (please list): 6,170 ft

Comments: Other is brushing

Please give an estimate of cumulative length of ditches maintained from the list above **SALTMARSH:**

Hand cleaning
Mechanized cleaning 8,490 ft
Other (please list):

What time frame during the year is this method employed?

Comments: _____

***Please attach a link to maps of ditch maintenance areas if possible.**

MONITORING (Measures of Efficacy)

Please describe monitoring efforts for each of the following:

Aerial Larvicide – wetlands:	Pre and Post application
Larvicide – catch basins:	
Larvicide-hand/small area	Prior to treatment
Ground ULV Adulticide:	Periodic landing rate checks and trapping data
Source Reduction:	Per established Mass. Best Management Practice
Standards	
Open Marsh Water Management:	Per established Mass. Best Management Practice
Standards	
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):

OPEN MARSH WATER MANAGEMENT

Do you have an OMWM program? Yes

If yes, please describe: We have had an OMWM program on and off since the late 1980's. We currently have permits from the Army Corps of Engineers until 2015.

Please give an estimate of total square feet or acreage: The OMWM site is on a marsh that is less than 10 acres in size. The actual area of disturbance is much less than 10 acres.

What time frame during the year is this method employed? We monitor sites in the summer and then do any site modifications during the winter months.

Comments: We are planning to do some maintenance of an OMWM project in Mattapoissett. This project was originally dug in 2002.

***Please attach a link to maps of OMWM areas if possible.**

ADULT MOSQUITO SURVEILLANCE

Do you have an adult mosquito surveillance program? Yes

Please list the number (not location) of MDPH traps in your service area: There were 14 MDPH traps in our district this year. The number was higher than in previous years due to the increase in EEEV activity.

Please check off all the types of surveillance that apply to your program:

- | | |
|---|---------------------------------|
| <input checked="" type="checkbox"/> Gravid traps | |
| <input type="checkbox"/> Resting boxes | |
| <input type="checkbox"/> CDC light traps | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> CDC light traps w/CO ₂ | <input type="checkbox"/> Canopy |
| <input type="checkbox"/> ABC light traps | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> ABC light traps w/CO ₂ | <input type="checkbox"/> Canopy |
| <input type="checkbox"/> NJ light traps | <input type="checkbox"/> Canopy |
| <input checked="" type="checkbox"/> NJ light traps w/CO ₂ | <input type="checkbox"/> Canopy |

Other (please describe):

Please 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 efforts.

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

If yes, please describe how you chose these long-term sites. We maintain a system of NJ traps that have been at the same locations for numerous years. In cooperation with DPH we have in recent years begun to maintain our own sites for disease surveillance. Locations were chosen using a variety of factors including disease history, neighboring wetlands and location of DPH traps.

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

- | | |
|--|---|
| <input type="checkbox"/> <i>Ae. albopictus</i> | <input checked="" type="checkbox"/> <i>Oc. cantator</i> |
| <input checked="" type="checkbox"/> <i>Ae. cinereus</i> | <input checked="" type="checkbox"/> <i>Oc. excrucians</i> |
| <input checked="" type="checkbox"/> <i>Ae. vexans</i> | <input checked="" type="checkbox"/> <i>Oc. fitchii</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. punctor</i> |
| <input checked="" type="checkbox"/> <i>Cq. perturbans</i> | <input checked="" type="checkbox"/> <i>Oc. sollicitans</i> |
| <input checked="" type="checkbox"/> <i>Cx. pipiens</i> | <input checked="" type="checkbox"/> <i>Oc. stimulans</i> |
| <input checked="" type="checkbox"/> <i>Cx. restuans</i> | <input checked="" type="checkbox"/> <i>Oc. taeniorhynchus</i> |
| <input checked="" type="checkbox"/> <i>Cx. salinarius</i> | <input checked="" type="checkbox"/> <i>Oc. triseriatus</i> |
| <input checked="" type="checkbox"/> <i>Cs. melanura</i> | <input checked="" type="checkbox"/> <i>Oc. trivittatus</i> |
| <input checked="" type="checkbox"/> <i>Cs. morsitans</i> | <input checked="" type="checkbox"/> <i>Ps. ferox</i> |
| <input checked="" type="checkbox"/> <i>Oc. abserratus</i> | <input type="checkbox"/> <i>Ur. sapphirina</i> |
| <input checked="" type="checkbox"/> <i>Oc. canadensis</i> | |

Other (please list):

Do you participate in the MDPH Arboviral Surveillance program? Yes

How many pools do you submit weekly on average? 26

Please check off the arboviruses found in your area in the past 5 years:

- West Nile Virus
- Eastern Equine Encephalitis
- Other Please list: Dog heartworm

Did the above listed diseases cause human or horse illnesses? No

Please explain:

At what arbovirus risk level did the year begin in your area? (If more than one please list)

WNV: We started at low risk for all of our district.

EEE: We started the season:

Remote: Hingham, Hull and Cohasset

Low: Brockton, Abington, Whitman, Rockland, Hanson, Norwell, Pembroke, Hanover, West Bridgewater, East Bridgewater, Bridgewater, Lakeville, Plymouth, Marion, Wareham, Kingston, Duxbury, Marshfield, Rochester , Mattapoisett and Scituate

Moderate: Middleboro, Carver, Plympton and Halifax

High: none

Critical: none

At what arbovirus risk level did the year end in your area? (If more than one please list)

WNV: We ended the season at low risk for all of our towns.

EEE: We ended the season:

Remote Risk: Hingham, Hull and Cohasset

Low Risk: Abington, Whitman, Hanover, Scituate, Marshfield, Pembroke, Rockland, Kingston, Duxbury, Plymouth, Wareham, Marion, Mattapoisett, Norwell and Rochester

Moderate Risk: East Bridgewater, Brockton, Hanson, Halifax, Plympton, Carver and Lakeville

High Risk: Bridgewater, West Bridgewater and Middleboro

Critical: none

What time frame during the year is this method employed? We started trapping at the end of May but as per DPH's request we did not submit mosquitoes until 20 June 2011. Surveillance continued until 13 September 2011.

Comments: _____

***Please attach a link to maps of surveillance areas if possible.**

EDUCATION, OUTREACH & PUBLIC RELATIONS

Do you have an education/public outreach program program? Yes

If yes, please describe: The Program includes issuing press releases, education using the Project's website, identifying connections between mosquito education and the Massachusetts Curriculum Frameworks, making public presentations to various adult and youth audiences, and keeping local boards of health etc updated on mosquito related issues.

Please check off all that apply:

- School based program
- Website
- PR brochures/handouts
- Community events
- Science fairs
- Meeting presentations
- Other (please describe): Outreach to school administrators and health agents regarding the Children's Protection Act. Frequent newspaper releases throughout the season - this year's themes continued stressed the importance of self protection through education and using repellents and homeowner actions that could be taken to reduce the risk of mosquito bites

Please give an estimate of attendance/participants in this program: During the course of the year there well in excess of 100 individuals reached by the outreach programs and the numbers reached through press releases, the website, and use of radio station opportunities (such as WATD) are too difficult to estimate.

Please list some events you participated in for the year of this report: Wareham Health Fair, Whitman/Hanson Mosquito Awareness Night - Sponsored by Rep. Daniel Webster, Hanson Church sponsored Mosquito Safety Night, Kingston Council on Aging..

What time frame during the year is this method employed? On going

Have you performed any research projects, efficacy, bottle assays, etc.? Yes

If yes, please elaborate on your research projects: We conducted a cage test trial of our ground ULV applications.

Are you involved in any collaboration with academia, industry, environmental groups, etc.? Not at this time

If yes, please elaborate on your collaborations this past year:

Please provide a list of technical reports, white/grey papers, publication in journal or trade magazines, etc.

Does your staff participate in educational opportunities? Yes

If yes, please list the training and education your staff received this year: We have begun discussions on bringing Arbovirus education in to the public schools. The Goal is to make this connection through the Massachusetts Curriculum Frameworks and have it become a formal part of the Comprehensive Health and Science class curriculum

Please list the certifications and degrees held by your staff: Excavator operator ,Pilot - Greg Goodband, U.S. Commercial Airline Certificate, Commercial Certification 34 + 47 CDL, Hoisting License- Excavator operator - Brian Callahan Commercial Certification 47 CDL, Hoisting License, - Field Technicians: Edward Medeiros B.S., Applicators license CDL, Hoisting License, - Dan Cabral Commercial Applicator - Richard Goodwin Commercial Certification 47, Hoisting License - Christopher Hanna Commercial Certification 47, Hoisting License - George Rego Applicators license, CDL, Hoisting License - Ellen Bidlack B.S., M.A., Commercial applicators Certificate 47 - Anthony Texeira B.S., M.A.T. Commercial Certificate 47 - General Foreman Steve Gillett Commercial Certification 47, CDL, Hoisting License, Dan Daly BS, M Ed., CAGS.

Comments: _____

BIOLOGICAL CONTROL EFFORTS

Do you have a biological control program? No

If yes, please describe:

Is this program the introduction of mosquito predators or the enhancement of habitat for native predators?

Please check off all that apply:

- Predatory fish
- Predatory invertebrates
- Other (please describe):

What time frame during the year is this method employed?

Comments: _____

INFORMATION TECHNOLOGY

Does your program use (check all that applies):

- Computers
- GIS mapping
- GPS equipment
- Computer databases
- Aerial Photography
- Other (please describe):

Please describe your capabilities in these areas: Our goal is to use computers and GIS technology to improve record keeping, efficiency and communication. As a result these tools have been used in a variety of ways to meet these goals. Over the past 10 years our service requests have been put directly into a database. We have been using this Service Request system since 2009. The system decreases data entry errors and speeds handling of the requests. We have geocoded two years of service requests to help us identify areas where we can improve our larviciding. Other ways we have been using technology includes installing PDAs and GPS units in all our trucks with ULV sprayers. This system tracks when and where the sprayer was used as well as other information. PCMCP's also uses GIS technology to map our trap sites and help determine trap placement breeding sites and sensitive habitats. We are developing a system using GIS and computer databases to improve tracking of our hand larviciding sites and ditch maintainace.

Please describe your current GIS abilities: Intermediate

Give details if possible on your GIS abilities: We currently have: ArcGIS 9.1 installed on one computer, 3 hand held GPS units including 1 Trimble GeoXT. We have GPS unitis installed in 11 of our trucks .We make use of MassGIS' data for our aerial photography, wetland maps and other data.

Please describe any changes/enhancements in this area from the previous year:

Comments: _____

REVENUES & EXPENDITURES

Please give a concise statement of revenues & expenditures for the prior fiscal year ending June 30.

For FY11, PCMCP had a budget assessment of \$1,319,167 plus a rollover amount from FY10 of \$74,974, and a EEE supplemental budget of \$132,540, a combined total of \$1,526,681. Payroll expenditure was \$774,200. Chargebacks from Group Insurance, Medicare, Work.Comp was in the vicinity of \$176,000. Retirement portion was \$125,881. Insecticides purchased was \$213,000. Auto, liability, airplane insurance totaled approximately \$47,000, SRB's chargeback was approx. \$20,000. The balance was expended on rent for office, rent for aircraft (also maintenance on aircraft), utilities, office supplies, various shop supplies, repairs and maintenance on state vehicles, fuel for vehicles and airplane, lab equipment, mapping and aerial spray program.

List each **member municipality along with the corresponding (cherry sheet) funding assessment** dollar amount for the prior fiscal year.

Comments: Municipality

ABINGTON - \$27,211

BRIDGEWATER - \$50,182

BROCKTON - \$88,718

CARVER - \$47,685

COHASSET - \$29,359

DUXBURY - \$54,909

East Bridgewater - \$31,412

HALIFAX - \$23,744

HANOVER - \$37,591

HANSON - \$25,730

HINGHAM - \$70,606

HULL - \$20,888

KINGSTON - \$34,855

LAKEVILLE - \$43,329

MARION - \$29,225

MARSHFIELD - \$68,403

MATTAPOISETT - \$30,291

MIDDLEBOROUGH - \$90,848

NORWELL - \$41,167

PEMBROKE - \$43,023

PLYMOUTH - \$177,827

PLYMPTON - \$18,364

ROCHESTER - \$41,194

ROCKLAND - \$26,883

SCITUATE - \$52,746

WAREHAM - \$68,247

WEST BRIDGEWATER - \$25,026

WHITMAN - \$19,704

PESTICIDE USAGE

Please total your pesticide usage with information from your Mass. Pesticide Use Report, WNV Larvicide Use records and contracted pesticide applications. Applications methods include; hand/backpack, aerial, ULV, mistblower, other (please explain)

Product Name: Altosid pellets / Altosid pellets wsp
EPA Reg. #: 2724-448
Application method: Hand
Targeted life stage: Larvae
Total amount of concentrate applied: 905 lbs
Comments: _____

Product Name: Duet
EPA Reg. #: 1021-1795-8329
Application method: ULV
Targeted life stage: Adult
Total amount of concentrate applied: 371 Gals
Comments: _____

Product Name: Flit 10 EC
EPA Reg. #: 8329-67
Application method: Hydraulic sprayer
Targeted life stage: Adult
Total amount of concentrate applied: 5 Gals
Comments: _____

Product Name: Altosid XR briquets
EPA Reg. #: 2724-421
Application method: hand
Targeted life stage: Adult
Total amount of concentrate applied: 11 lbs
Comments: _____

Product Name: Summit b.t.i. briquets
EPA Reg. #: 6218-47
Application method: Hand
Targeted life stage: Larvae
Total amount of concentrate applied: 48 1/2 lbs
Comments: _____

Product Name: Vectobac CG

EPA Reg. #: 73049-19
Application method: Aircraft / Backpack
Targeted life stage: Larvae
Total amount of concentrate applied: 4,382 lbs
Comments: _____

Product Name: Vectobac 12 AS
EPA Reg. #: 73049-38
Application method: Aircraft / Hydraulic sprayer / pump-can
Targeted life stage: Larvae
Total amount of concentrate applied: 2,672 lbs
Comments: _____

Product Name:
EPA Reg. #:
Application method:
Targeted life stage: Choose one
Total amount of concentrate applied:
Comments: _____

Product Name:
EPA Reg. #:
Application method:
Targeted life stage: Choose one
Total amount of concentrate applied:
Comments: _____

LARGE AREA EXCLUSIONS

Do you have large areas of pesticide exclusion, such as estimated or priority habitats?
No

If yes, please explain, and attach maps or a web link if possible.

SPECIAL PROJECTS

Do you perform any inspectional services such as inspections at sewage treatment facilities or review sub division plans? No

If yes, please elaborate

Do you work with DPW departments or other local or state officials to address stormwater systems, clogged culverts or other areas that you have identified as man-made mosquito problem areas? Yes

If yes, please elaborate: We continue to work with local DPW on water management programs

Have you worked with these departments on long term solutions? Yes

If yes, please elaborate:

Did you conduct or participate in any cooperative research or restoration projects?

If yes, please elaborate:

Did you or participate on any **State/Regional/National workgroups or panels or attend any meeting pertaining to the above?**

If yes, please elaborate:

CHILDREN AND FAMILIES PROTECTION ACT

Is your program impacted by the Children and Families Protection Act? Yes

If yes, please explain: The Project finds it necessary to educate and/or re-educate many schools/school districts on the requirements of the Act including changes in Standard Written Notification options. Additionally, the Project found as certain school personell changed it was often necessary to review how to access and update IPM Plans. The Project's website has several pages of information on the act for school implementation.

If you have data on compliance with this Act and your program, please list here:

If you had difficulties with implementation of your program due to this law, please elaborate here:

Comments:

GENERAL COMMENTS

Please list any comments not covered in this report: _____



THE COMMONWEALTH OF MASSACHUSETTS
THE STATE RECLAMATION & MOSQUITO CONTROL BOARD



Plymouth County MOSQUITO CONTROL PROJECT

142R PEMBROKE STREET, P.O. BOX 72, KINGSTON, MA. 02364-0072
TELEPHONE (781) 585-5450 FAX (781) 582-1276
www.plymouthmosquito.com

Commissioners:

Carolyn Brennan - Chairman
Leighton F. Peck, Jr.
Kimberly King
John Kenney
Michael F. Valenti

Anthony Teixeira - Superintendent
Jo Ann M. Fawcett - Project Coordinator
Stephen A. Gillett - General Foreman

PDMP Pesticide Discharge Management Plan

Pesticide Discharge Management Plan

For: Plymouth County Mosquito Control Project, Kingston, MA

Permit Year: 2011

Permit No: (if applicable)

Valid thru:

Last revised:

This PDMP (Pesticide Discharge Management Plan) documents the evaluation and selection of control measures to meet the effluent limitation in the General Permit. It also documents the implementation*(including inspection, maintenance, monitoring and any applicable corrective action) of the General Permit requirements. This PDMP may refer to procedures in other documents that meet the requirements of this permit.

If other documents are referenced, such as a pre-existing integrated pest management (IPM) plan, a copy of the relevant portions may be obtained at the location listed.

Terms used in this document are defined in the (specific state or Federal permit).

CONTENTS

1. Responsible Parties & Contact Information
2. Location(s) & Purpose for Treatments
3. Evaluation and Selection of Pest Management Strategy
4. Pesticide Monitoring
5. Spill Prevention & Response Procedures
6. Equipment Maintenance
7. Adverse Incident Response
8. Attachments

PLYMOUTH COUNTY MOSQUITO CONTROL PROJECT

1. Responsible Parties & Contact Information

Organization / Department Location

Name: Plymouth County Mosquito Control Project

Address: PO Box 72 142R Pembroke Street Kingston, MA 02364

Person responsible for Pest Management Program as outlined in PDMP

Name: Anthony Texeira

Title: Superintendent

Telephone: 508-781-5450

Email: ateixeira@plymouthmosquito.org

Mail Address if

different than above: PO Box 72 Kingston, MA 02360

Person responsible for developing/revising PDMP (if different than above)

Name:

Title:

Telephone:

Email:

Mail Address if

different than above:

Person responsible for corrective actions when required

Name: Same

Title:

Telephone:

Email:

Mail Address if

different than above:

Person or party responsible for pesticide applications within area defined in PDMP

Superintendent, Anthony Texeira

Entomologist, Ellen Bidlack

General Foreman Steve Gillett

Excavator operator, Pilot, Greg Goodband,

Excavator operator, Brian Callahan

Field Technicians:

Edward Medeiros

Dan Cabral

Richard Goodwin

Christopher Hanna

George Rego

Ronald DeMoura

Brandon Gillett

PLYMOUTH COUNTY MOSQUITO CONTROL PROJECT

Lawrence Hunt
Thomas McPhee
Ann Motyka
Stephen Schwarz
Allan Tassinari

2. Locations & Purpose for Treatments

LOCATION

A. Area description

The towns within the Plymouth County Mosquito control Project, all of Plymouth County and the town of Cohasset, Massachusetts

- 28 towns
- Population: 480,022
- 1100 sq miles 704,000 acre
- Wetlands: 112,000 Total Acres
 - Salt marsh: 6,362 Acres
 - Wooded conifer wetlands: 2,240
 - Wooded deciduous wetlands: 26,228
 - Mix wood wetlands: 21,460
 - Shrub wetlands: 7,925
 - Shallow marsh or fen: 5,265
- Watersheds: Taunton River
 - Boston Harbor
 - South Coastal
 - Buzzards Bay

B. Map (see Attachments)

PURPOSE

C. Use Pattern / Mosquitoes

a. Pest management objectives

Adult mosquito suppression 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 time frame for this program is May – October.

PLYMOUTH COUNTY MOSQUITO CONTROL PROJECT

Source reduction:

Is comprised of ditch maintenance program, OMWM (Open Marsh Water Management) and education. We often inspect properties and offer advice to landowners regarding actions they can take to reduce the amount of mosquito production on their property.

Ditch maintenance program:

Maintain inland and saltmarsh ditches by hand and mechanized cleaning.

Monitoring:

Aerial Larvicide – wetlands: pre and post application.

Larvicide – catch basins,

Larvicide by hand/small area prior to treatment.

Ground ULV adulticide: periodic landing rate checks and trapping data.

Source Reduction: Per established Mass. Best Management Practice Standards

Open Marsh Water Management: Per established Mass. Best Management Practice Standards

Open Marsh Water Management (OMWM) program:

OMWM is a widely used technique that seeks to reduce mosquito production on salt marshes. The technique works by improving fish habitat on the salt marsh in places that normally produce mosquitoes. The fish eat the mosquito larvae reducing the need to apply pesticides to the salt marsh. OMWM has the added benefit of reversing the impacts of grid ditching which dries out the marsh. This method can also be combined with other restoration efforts such as restoring tidal flow to tidally restricted marshes or *Phragmites* control. Plymouth County Mosquito Control has been conducting OMWM on and off since the 1980's. Currently the project has OMWM permits that are effective until 2016.

Adult mosquito surveillance:

To monitor the mosquitoes for diseases, to determine general population levels and to decide where we can better focus our larvaciding efforts.

Education/public outreach program:

To educate the public and updated on mosquito related issues. the Program includes issuing press releases, education using the Project's website, identifying connections between mosquito education and the Massachusetts Curriculum Frameworks, making public presentations to various adult and youth audiences, and working with local boards of health etc

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D. Target Pest/Species

The species of concern in the service area:

***Aedes cinereus*:** *Ae. cinereus* is known as an ankle biter. The mosquito is small and unobtrusive, frequently biting people's ankles and lower legs. Often people are not aware of the bites until they begin to itch. The larvae are found in a variety of woodland pools they are often found with *Oc. canadensis*, *Aedes vexans* or *Cx. territans*.

***Aedes vexans*:** One of the most common mosquitoes in Plymouth County. The adults are aggressive human biters and are most active from early evening until midnight. The larvae of this mosquito are found in temporary water such as puddles or flooded areas. In wet years the mosquito may have several generations each year. It has been implicated in the transmission of Eastern Equine Encephalitis (EEEV) to people.

***Anopheles punctipennis*.** *An. punctipennis* is a visually distinctive mosquito due to its obvious black and gold pattern on the wings. The adults overwinter in buildings, caves, animal burrows and other sheltered areas. The overwintering mosquitoes are often active on warm winter days and in early spring. The larvae are found most often in ponds with emergent vegetation.

***Anopheles quadrimaculatus*:** This mosquito overwinters as an adult and will come out and bite on a warm winter's day. The mosquito prefers to bite farm animals such as cows and horses but will bite people when given the opportunity. The larvae are found in slow moving canals, lakes, ponds and puddles. It is associated with emergent vegetation in these areas.

***Anopheles walkeri*:** The mosquito bites people and other large mammals such as horses and cows. It will bite during the day and at night. The adult mosquito can tolerate cool temperatures and may be active in late fall. The larvae are found in permanent or semi-permanent fresh water with emergent vegetation such as grass lined pools or cattail marshes. The mosquito is known to carry dog heartworm.

***Coquillettidia perturbans*:** One of the most common mosquitoes in Plymouth County. The adults are aggressive human biters and are most active in the evenings. The insect has one generation each year. The adult populations usually peak around the 4th of July. The larvae of this mosquito are unusual. They obtain their oxygen by drilling their airtube into roots of emergent aquatic vegetation such as cattails (*Typha. sp.*) and swamp loosestrife (*Decodon verticillatus*). The larvae are often found attached to emergent vegetation in the reservoirs for cranberry bogs. There is substantial evidence to suggest that it is the main human vector of Eastern Equine Encephalitis to people in Plymouth County.

***Culex pipens*:** *Cx. pipens* is known as the common house mosquito because of its association with people. It will enter buildings and is the only mosquito where the larvae may be found in water within homes. However, it is usually found in containers such as tires, pools and buckets. *Culex pipens* is one of a few mosquitoes that can tolerate highly polluted water and may even be found in sewage. Despite its association with humans the mosquito prefers to blood feed on birds. It is a major vector in the transmission of West Nile Virus (WNV) to birds and there is increasing evidence that it is also involved in transmitting the virus to people.

***Culex restuans*:** This mosquito is very similar to *Cx. pipens* in both its behavior and looks. However, the mosquito is more cold tolerant and is found earlier in the spring than *Cx. pipens*. It is also believed to be a vector of West Nile Virus to birds.

***Culex salinarius*:** This is a common mosquito throughout the county. Adults are readily attracted to light traps, and larvae are found in both freshwater and brackish water. It has been found to carry dog heartworm, EEEV and WNV.

***Culiseta melanura*:** This mosquito is a bird biter and does not feed on humans. The larvae live in red maple or cedar swamps. Within these swamps they are found in cavities formed by root systems of the trees. *Cs.*

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melanura has one or two generations each year. The mosquito is the main vector Eastern Equine Encephalitis Virus to birds. It may also be involved in the transmission of West Nile Virus to birds in rural areas as well.

Ochlerotatus abseratus: *Oc. abseratus* is one of the most common mosquitoes in the spring. The species is long lived and has one generation a year. The larvae live in a variety of freshwater habitats. While they are not considered a vector of human disease, they are an aggressive biter and a significant pest in the spring.

Ochlerotatus canadensis: Although this mosquito has one generation each year the eggs hatch in installments, as a result it can be found throughout the summer. It is common in the spring and a pest on Memorial Day. *Oc. canadensis* larvae are found in a variety of freshwater habitats. It is implicated in the transmission of Eastern Equine Encephalitis Virus to people and in transmission of dog heartworm to canines.

Ochlerotatus cantator: This common mosquito is an aggressive evening biter in open areas. The adults are attracted to light and may enter buildings. The larvae are found in temporary fresh or brackish water on or near salt marshes. It may also be found in brackish pools near roads.

Ochlerotatus excrucians: The larvae of *Oc excrucians* occur in a wide variety of freshwater habitats including red maple swamps. The mosquito has one generation in the spring. They are an aggressive human biter but are not vectors of human disease.

Ochlerotatus japonicus: *Oc. japonicus* is a recent introduction to the United States. The mosquito is originally from Japan and it is believed that the mosquito entered this country in tires or other containers. The mosquito is a day biter and bites mammals. The adults will readily enter buildings. The larvae are found in containers such as tires, buckets and pools. The larvae may also be found in natural containers like tree holes or depressions in rock. It is a suspect in the transmission of West Nile Virus to people.

Ochlerotatus sollicitans: This mosquito is a very aggressive day biter. It is common for the mosquito to rest in the grass and when disturbed come out and bite. Because it is a day biter it is not readily attracted to our light trap and just a few individuals in the trap may indicate a large population. The mosquito larvae are found on salt marshes in areas that are flooded only on the large tides or after heavy rains. Unlike *Oc. cantator* it can tolerate highly saline water.

Ochlerotatus taeniorhynchus: The common name for *Oc. taeniorhynchus* is the Southern Salt Marsh Mosquito. The insect is found along both the Pacific and Atlantic coasts. It ranges as far south as Brazil and Peru. Massachusetts is in the northern limits of its range. The larvae are found on salt marshes after heavy rains or large tides. The adults are small black and white mosquitoes that bite at anytime of the day or night.

E. Action Thresholds

a. Larval Threshold: more than 1 per dip, up to twenty dips per site.

b. Adult Threshold: more than 5 human-biters per light trap per night, more than one landing per minute.

Known Waters within treatment area to which there will be a discharge

F. Impaired waters

Are not treated

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3. Evaluation and Pest Management

Mosquito control in Massachusetts has been subject to MEPA review. In 1998, a Generic Environmental Impact Report (GEIR) was commissioned and submitted to MEPA. The document can be found at the Board's website (<http://www.mass.gov/agr/mosquito/geir.htm>). This meaningful document summarizes the history of mosquito control in Massachusetts, describes the extent of problems due to mosquitoes, reviews the scope and effectiveness of past and current control practices, discusses the potential and real environmental costs of such actions, reviews alternative strategies, and makes recommendations for future improvement. It was intended as a living document, to be updated as practices and procedures advanced. During original time of the review, the GEIR identified a few diverse issues that needed clarification such developing Best Management Practices (BMP) for specific mosquito control activities and practices. Addressing such issues would incrementally improve the general practice of mosquito control in Massachusetts; see Documents 4 and 5, "MEPA Certificate_5027_February 15, 2008" and "MEPA Certificate_5027_October 25, 1998" of the 1st EIR filing (http://www.mass.gov/agr/mosquito/mepa_filing_102408.htm).

4. Pesticide Monitoring

Monitoring Sites

For each mosquito control application a record is kept:

1. Date, time and areas where application occurred.
2. Name and EPA registration number for the product being applied.
3. Type and size of spray nozzle used.
4. Dilution and application rate.
5. Employees involved in mixing, loading and applying larvicide.
6. These records must be kept by the responsible public agency or their designee for a minimum of three years using storage methods that will allow the records to be easily retrieved.

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Pest Management Strategy

Plymouth County Mosquito control Project uses an approach known as Integrated Pest Management or IPM. There are many different definitions of IPM. However, one definition used by Massachusetts mosquito control projects is derived from the State Pesticide Control Act (section 7 of Chapter 132 B of the MGL). "Integrated pest management", a comprehensive strategy of pest control whose major objective is to achieve desired levels of pest control in an environmentally responsible manner by combining multiple pest control measures to reduce the need for reliance on chemical pesticides; more specifically, a combination of pest controls which addresses conditions that support pests and may include, but is not limited to, the use of monitoring techniques to determine immediate and ongoing need for pest control, increased sanitation, physical barrier methods, the use of natural pest enemies and a judicious use of lowest risk pesticides when necessary.

1. Disease Monitoring

Plymouth County Mosquito Control Project works closely with the Massachusetts Department of Public Health (DPH) to monitor West Nile Virus and Eastern Equine Encephalitis Virus activity and to help determine the level of human risk. The Project runs traps for adult mosquitoes in areas we consider likely to have virus activity in mosquito populations. The mosquitoes collected are sent to DPH and tested for mosquito borne viruses.

2. Larval Site Identification:

Project personnel identify and catalog suspected mosquito larval habitat. Once a site has been proven to contain mosquito larvae, a decision is made on how to best treat the site. It will become part of the Site Reduction Program or the Larviciding Program. Site cards are completed for each site identified. The cards include the following information: directions to the site, dates of site inspections, results of each observation (if mosquito larvae are found – species, number/dip, and stage of development), and what action was taken (was the site treated). In recent years PCMCP has been working on obtaining GPS coordinates for these sites. This will allow the project to map the sites and improve record keeping.

3. Site Reduction:

Breeding site reduction **is the most effective strategy** for reducing mosquito populations. This strategy may require hand-clearing a clogged stream or even the use of heavy digging equipment to remedy the problem. The Project does not drain wetlands and will only clear or dig on sites that have been confirmed to breed mosquitoes. Restoring the flow of a small stream or removing a blockage in a drainage ditch are examples of appropriate Project activities in the Site Reduction Program.

An important part of the breeding site reduction program is **Open Marsh Water Management** (OMWM). This technique is used only on salt marshes. OMWM was originally developed in New Jersey and is considered to be an environmentally sensitive alternative to grid ditching salt marshes. OMWM holds water on the marsh, improves fish habitat and reduces evasive vegetation. The heart of most **OMWM** projects is the creation of ponds on the marsh that can be used by small fish and wading birds. Ditches from the pond to areas that produce mosquitoes allow the fish to eat the mosquito larvae when they are present. OMWM is an important tool in areas where the goal is restoration as well as mosquito control.

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4. Larviciding:

Larviciding is the **second most effective strategy for reducing mosquito populations**. Most larval habitats are not appropriate for the site reduction strategy and as a result larviciding is the Project's primary strategy for controlling mosquito populations. The Project uses a variety of equipment to larvicide areas that produce mosquitoes. Small sites can be treated by a Project worker using a hand-held pump can. They may also be treated using a specially equipped truck. The vehicle has a hydraulic sprayer and over 300 feet of hose, which enables personnel to treat many sites. However, the majority of acres is done in the spring through the use of aircraft. Using the Project's Cessna Ag Wagon approximately 10,000 acres are treated each year. In some years PCMCP hires a helicopter to help with this work. *Bti* (*Bacillus thuringiensis israelensis*), a biological insecticide, is the primary material used in the larviciding program. It is the only product used in our aerial program. Daily records and weekly summaries are kept for all larviciding activities.

5. Adulticiding:

Since no method of mosquito control is 100% effective, the Project sprays for adult mosquitoes. This strategy is employed at the request of individuals living in member communities. Individuals can call the Project, between 8:00am and 3:00pm on Monday through Friday, to request that their property be sprayed. The Project's phone number is (781) 585-5450, fax (781)582-1276 or mail us at P.O. Box 72, Kingston, MA 02364. To find out where the spray routes are going to be call (617) 582-6219 (during spray season). Project personnel spray for mosquitoes, using trucks, between the hours of 2:00am and 7:00am, Monday through Friday. The Project uses ultra low volume (ULV) sprayers, which allows minimal amounts of pesticide to be used. As was the case with larviciding, daily records and weekly summaries are kept for all adulticiding work. These records are kept by community treated.

6. Public Education: While listed sixth on this page, the placement does not reflect the priority level we place on public education. We believe that education is our top priority. In fact, most of the our website is dedicated to education. You will find information about pesticides, repellents, mosquito life cycle, mosquito borne diseases (West Nile Virus, Eastern Equine Encephalitis, and dog heartworm), controlling mosquito breeding around the home, important state regulations, and links to mosquito information and education websites. Additionally, we provide speakers for schools, community organizations, and civic groups. We also have attempted to provide the schools of Plymouth County with opportunities for bringing mosquito education into their classrooms and connect it to the Massachusetts Curriculum Frameworks.

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5. Spill Prevention & Purpose

A) Daily maintenance activities are conducted to minimize potential for spills, leaks and unintended release of pesticides.

Spill response procedures: Chemical spill response training is required for staff handling, loading or applying pesticides.

B) Spill response contacts

Name: Anthony Texeira
Phone: 781-585- 5450
Phone: 781-585-4828
Title: Superintendent
Plymouth County Mosquito Control Project

Onsite and Offsite Cleanup - Enviro Flex Impairment Liability, Evanston Ins. Co.
National Pesticide Telecommunications Network – 800/858-7378
National Spill Response Center – 800/424-8802

6. Equipment Maintenance

A) Maintenance Procedures & Timing

1) ULV sprayers

- Calibration before the start of each season (*report)
- Droplet size testing at the start of each season (*report)
- Monthly ultrasonic cleaning of electric spray heads
- Weekly flush of electric sprayers
- Weekly wash of sprayer
- General overall assessment of equipment
- Check filters and replace as needed

2) Backpack sprayers:

Backpack Sprayer Calibration Protocol:

1. Label each sprayer with a unique number to identify. 2. Time how long it takes to spray 400 sq feet, by have the applicator spray water in a 4 foot swath walking a distance of 100 feet. 3. Spray water into buck for the amount of time determined in step 2. Measure the volume of the water in the bucket. 4. An acre is 43,560 sq feet, so 400 sq feet is 1/109 of an acre. Therefore, all measured volume from step 3 needs to be multiplied by 109. This gives you the ml applied per acre at the rate out application measured. 5. Take the figure determined in step 4 and convert to gallons. 6. Read pesticide label to determine the number of gallons that should be applied per acre and follow application directions.

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7. Adverse Incident Response Procedures

A) Course of action

Adverse incident response procedure: operator notifies office of incident (781)585-5450 and office notify town where incident occurred to coordinate any need for remediation

B) Reporting levels

1) Internal

Name: Anthony Texeira

Phone: 781-585- 5450

Phone: 781-585-4828

Title: Superintendent

Plymouth County Mosquito Control Project

2) State Level

Name: Lee Corte Reale

Phone: 617-626- 1776

Phone: 617-626-1715

Title: Chairman

Massachusetts State Reclamation and Mosquito Control Board

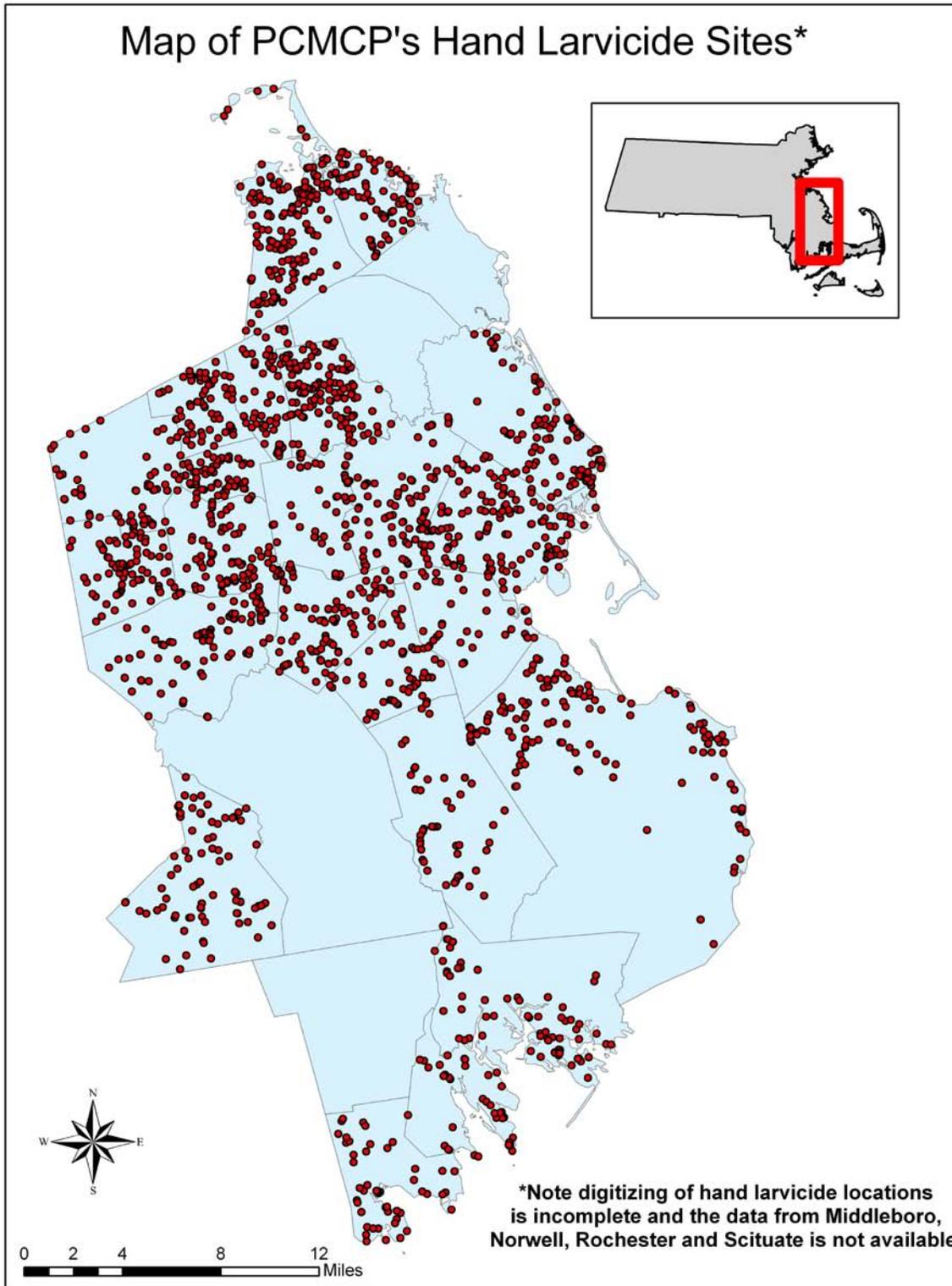
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Attachment A: PCMCP's service area



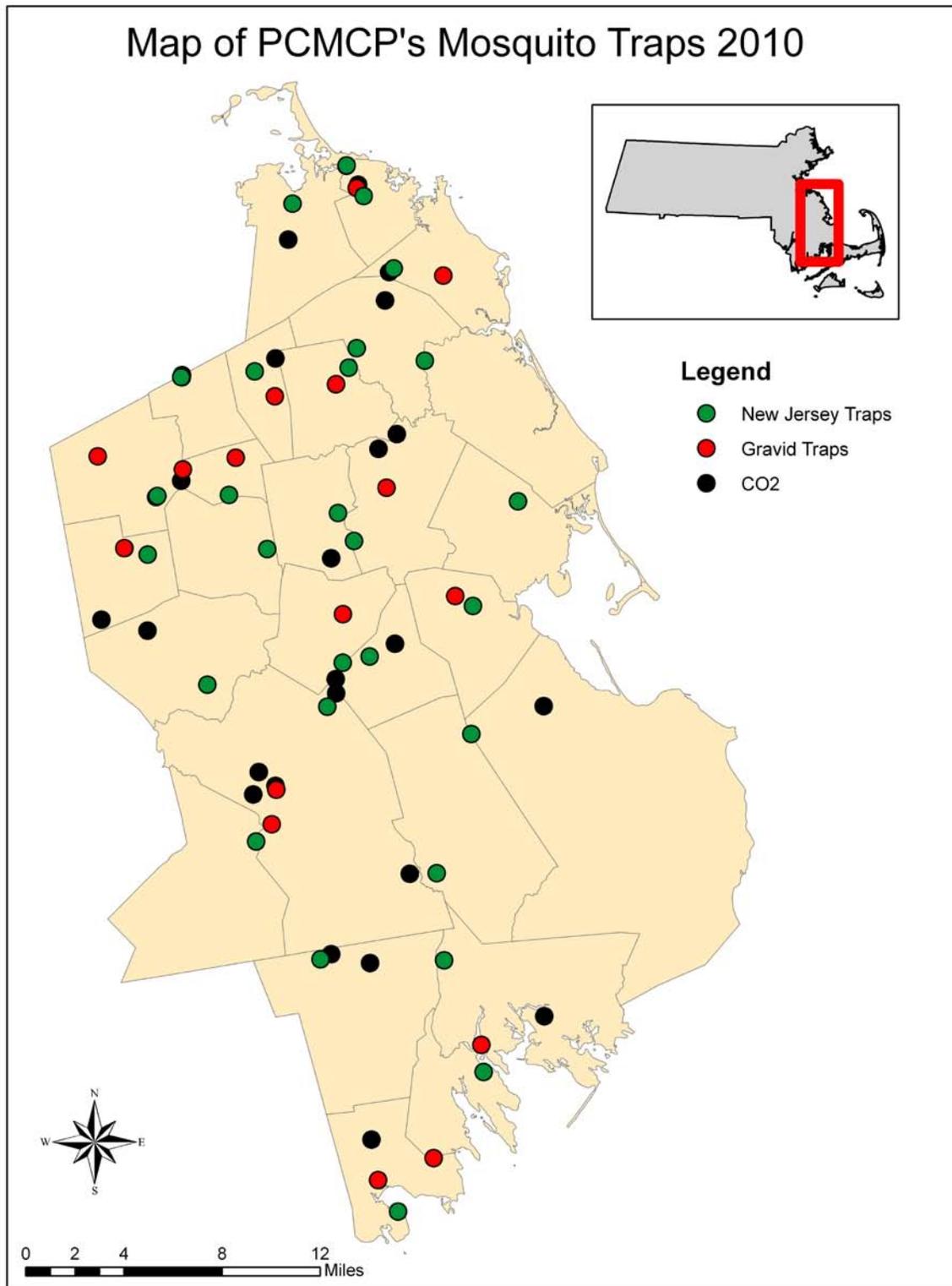
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Attachment B : Location of Hand Larviciding Sites Currently Mapped



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Attachment C: Location of Mosquito Traps



See Attached file: Plymouth County Mosquito Control town wetland maps