MASSACHUSETTS MOSQUITO CONTROL
ANNUAL OPERATIONS REPORT

2009 Year of Report Date of Report: 1/11/10

Project/District Name: **Northeast Mass. Wetlands Mgmt. Mosquito Control**

Address: 261 Northern Blvd. P.I.

City/Town: Newburyport Zip: 01950

Phone: (978) 463 - 6630 Fax: (978) 463 - 6631

E-mail: emmc@comcast.net

Report prepared by: *Jack A. Card, Dennis Gallant*

If you have a mission statement, please include it here: The Northeast Massachusetts Mosquito Control and Wetlands Management District represents the mosquito control and wetlands management interest of those communities that choose to subscribe to it's services. The prime directive of the District is to protect its citizens from mosquito-borne diseases by targeting specific, measured, and preemptive responses to specific risk as prescribed by the Districts annually-revised "Vector Management Plan" (VMP). To insure our citizens quality of life and the regional economy is not severely impacted by abundant pestiferous mosquito outbreaks, strategies targeted to reduce dominant mosquito populations are implemented as prescribed by the Districts annually-revised "Best Management Practice" (BMP) plans. BMP's are designed to incorporate the Districts environmentally sensitive and cost effective mosquito control strategies and the specific needs and concerns of each community..

ORGANIZATION SETUP:

Please list your Commissioner's names:

Peter M. Mirandi, RS, MPH Chairman
John W. Morris, CHO Vice Chairman
Vincent J. Russo, MD,MPH
Sharon Cameron, RSMPA

Please list the Supt./Director's name: Walter Montgomery
Please list the Supt./Director's contact phone number: (978) 463-6630
Please list your Asst. Supt./Asst. Director's name: Jack A. Card,Jr

Do you have a website? Yes

If yes, please list the web address here: http://www.northeastmassmosquito.com

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

Full time: 9
Part time: 1
Seasonal: 5
Other: (please describe)

Please break these down into the following areas:

Administrative staff: 1.5
Field staff: 15

Please check off all that apply, and list employee name(s) next to each category:
☒ Public relations Walter Montgomery, Esteban Cuebas-Incle, Jack Card (Emily Sullivan, Robyn Januszewski in varying capacities)
☒ Information technology Jack Card, Emily Sullivan, Robyn Januszewski
☒ Entomologist Esteban Cuebas-Incle
☒ Wetland Scientist (Emily Sullivan - Wetlands Project Coordinator)
☒ Biologist Robyn Januszewski
☒ Education Esteban Cuebas-Incle, Robyn Januszewski
☒ Laboratory Esteban Cuebas-Incle, Anthony Corricelli
☒ Operations Walter Montgomery, Esteban Cuebas-Incle, Jack Card, Emily Sullivan, Robyn Januszewski, Anthony Corricelli, Horrace Baxter (Seasonal) Thaddeus (Ted) Tatarzzuk (seasonal), William Montgomery (Seasonal), William Mehaffey Jr., Tim Hay, Maureen Douglas, Dennis Gallant, Richard Caron (Seasonal), Paul Howard (Seasonal)
☒ Facilities Jack Card - (all employees)
☐ Other (please list)

For the year of this report, we maintained:
22 vehicles
16 modified wetland equipment (list type) 4/99 Smally 808-D Excavator/rotary ditcher (out of service), Kassboher DR170 Flail mower/ditcher/grader(out of service), Kassboher DR270 Flail mower/grader, Kassboher PB270 Flail mower/Rotary ditcher/grader, Kassboher PB260 Dump Body/grader, 77 Bombardier Muskeg Dump Body, 87 Bombadier Muskeg Backhoe, 99 Link Belt 1600 Excavator,74 Eager Beaver Heavy Equipment Trailer (out of service), 95 Eager Beaver Heavy Equipment Trailer (rebuilt in 2007), 95 Hudson Spray Trailer, 97 Karavan Boat Trailer, 98 Car Mate Utility Trailer, 95 Alumacraft 13 foot Boat with 25 hp outboard motor, Wayne wood chipper, 96 Rokon all-terrain motor cycle, 1987 ARGO 6 wheel amphibious ATV, Clark type G fork lift
ULV sprayers (list type)

Type	Mod#/ Serial #	Purchased	Usage	Status
Electromist	#000445	2003	Spare Parts(fire) Shelf	#9 (05)

Electromist #000442 2003 Adulticiding Shelf #3 (05)

Electromist #000443 2003 Adulticiding Active #10 (06)

Electromist #000444 2003 Adulticiding Shelf #16(05)

Electromist #000411 NH 2005 Spare parts Shelf

Leco Model HD Series D 70001047 NH 06/20/06 Barrier Active #18(06)
(Blower Model 26-3210 S/N 6498C85)

Leco S/N # 7200373 ULV 1100 NH 01/22/08 Barrier Active #07(08)
(Blower Model RAI 89D S/N 93534 Roots ID # 865-105-20)

London Air XKE London Fog # 1783 (Adapco) 2005 Adulticiding Shelf #09(06)

London Air XKE London Fog #1781 (Adapco) 2005 Adulticiding Shelf (06)

Beco Mist Model 250 S/N 3534 (# C55409) 2006 Adulticiding Active #16 (08)

Beco Mist Model 250 S/N 3561 (# C55411) 2006 Adulticiding Active #13 (08)

Beco Mist Model 250 S/N 3565 (# C55408) 2006 Adulticiding Active #3 (08)

Beco Mist Model 250 S/N 3601 2006 Adulticiding Active #14 (08)
Replaced (06) with 3535

Beco Mist Model A002S S/N (# C55554) 2008 Adulticiding Back up #21 (08)

Beco Mist Model A002S S/N (# C55555) 2008 Adulticiding Active #22 (08)

Ag Sprayer Veg. Control Active Tr. (07)

Larval control equipment (list type) Birchmire Backpack - Pump Sprayers, Orchard Sprayers (Reel) Hand Application Devices

Other (please be specific):

Comments: _____

How many cities & towns in your service area? 32
Please list: Amesbury, Andover, Beverly, Boxford, Danvers, Georgetown, Groveland, Hamilton, Haverhill, Ipswich, Lynn, Lynnfield, Manchester-by-the-Sea, Marblehead, Merrimac, Methuen, Middleton, Nahant, Newbury, Newburyport, North Andover,

Peabody, Revere, Rowley, Salem, Salisbury, Saugus, Swampscott, Topsfield, Wenham, West Newbury, Winthrop

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

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): Inspectional Services, Development Plan Reviews, Invasive Vegetation Control, Wastewater and Water Treatment Facility inspections and treatments, Site Reviews, Greenhead Fly Control**

Comments: INSPECTIONAL SERVICES

The old saying an ounce of prevention is worth a pound of cure is very true in mosquito control. Early intervention or preemptive action to prevent a potential mosquito breeding site from becoming an actual mosquito breeding site is as much a control strategy as an application or treatment to an actual breeding site and often an existing mosquito breeding problem can be easily corrected. While the District is authorized under the provisions of chapter 252: section 4 of the General Laws of the Commonwealth to enter upon lands for the purpose of inspection it is not a regulatory agency. Nor is it our intention to cause any imposition on any citizen or business, but rather to be a resource for information and technology to help property owners prevent

or abate mosquitoes to the mutual benefit of the property owner, the community and mosquito control.

The District acts as a technical advisor as requested by the Board of Health and represent the municipalities public and animal health and human annoyance concerns relative to mosquito breeding, potential breeding and proposed development. The District, at the request of the board of health will also review site plans and inspect sites where storm water structures are planned or in the process of construction. Upon inspection of a site the District will make written recommendations, submit these recommendations to the board of health and cc the land owner.

The primary vector species of West Nile Virus, Culex pipiens usually breeds in artificial containers such as, catch basins, storm water structures, etc. In particular this species seems to thrive where others fail, due to their ability to survive in highly organic and polluted water These conditions are often associated with industrial or office parks, commercial or agricultural livestock facilities. Because of the potential for Culex species mosquito breeding, the primary vector of West Nile Virus in and around industrial or offices park, agricultural and livestock facilities the District will routinely inspect such areas.

LARVAL MOSQUITO CONTROL:

Do you have a larval mosquito suppression program? Yes

If yes, please describe the purpose of this program: To control mosquito populations pre-emptively, before they become adults.

Please give the time frame for this program: March - October

Describe the areas that this program is used: Upland, Salt Marsh, Man made.

Do you use:
☒ **Ground applied (includes hand, portable and/or backpack)**
☒ **Helicopter applications**
☐ **Other (please list):**
Comments: Policy and Procedure for Ground Larvaciding
revised 2/94, 1/98, 1/07

Surveillance: The Operations Manager will assign Field Technicians to specific areas. Field Technicians will use the Districts larviciding site data base to inspecte and treat sites in their assigned areas. If discrepancies are found or site changes have occurred Technicians will make note of the discrepancy and submit it with their Larviciding Report.

Ten random dips samples from each site will be taken and recorded on a Larviciding Report before site is treated. The maximum larvae to be counted per dip is thirty (30). This information will be entered into the data base to establish a breeding history, prioritize sites and justification for wetlands management site selection.

Freshwater: Ground larviciding will be restricted to small areas that can realistically be treated in a reasonable period of time in close proximity to residential or public use areas.

Salt Marsh: Following aerial salt marsh larviciding applications technicians may spot treat areas, as is necessary and practical, at their own discretion or as directed by the Operations Manager.

Application: Technicians will wear all protective clothing, equipment, etc., that may be required by label direction when mixing, applying or otherwise handling any pesticide. All pesticides will be used in strict accordance with label directions, pesticide regulations and application rates.

Larviciding Report: Field Technicians will complete a Larviciding Report and submit it with a Record of Pesticides applied as directed by the Operations Manager.

POLICY AND PROCEDURES FOR AERIAL SALT MARSH LARVICIDING 01/98 REVISED 1/07

Notification: The Director will publish a legal notice in February of each year in accordance with 333 CMR 13.05. The legal notice will give general information about aerial salt marsh larviciding applications, a contact person and telephone number. Specific dates and times of applications will be determined by surveillance data. municipal boards of health and the Massachusetts Pesticide Bureau will be notified by phone or fax prior to each application.

Pretreatment Surveillance: The Operations Manager will assign Field Technicians to specific areas. Designated Field tech's will generally observe flooding and rainfall events on the salt marsh in their assigned area. As flooding and rainfall events dictate Field Tech's will survey breeding sites. At the discretion of Field Tech's as many random dip samples will be taken as is necessary to determine the location and extent of breeding on a salt marsh. For the purpose of record keeping and efficacy evaluation a minimum of ten pre-chosen and fully recoverable dip stations will be established in each designated area. Dip samples will be taken from each of these dip stations prior to an aerial application and recorded on an Aerial Larviciding Survey – Pretreatment form.

Aerial Application: The Operations Manager will determine the optimum time of each application based on pretreatment surveillance data, tides, weather and conditions, availability of aircraft and general input from Field Tech's. The Director will notify health departments in each of the municipalities the applications is to take place. The Operations Manager will notify and coordinate with airport personnel, property owners or persons otherwise in charge of designated landing zones. Field Tech's will be responsible for designating sites to be sprayed in their assigned areas.

Landing Zone Operations: The Operations Manager will supervise and coordinate all LZ support operations such as water supply, pesticides supply, mix and formulation of finished spray and application rate. Record all data relative to the operate as prescribed in the District's Aerial Larviciding report. Rinse and disposal of pesticide containers.

Postreatment Surveillance: Field Tech's will survey sprayed sites no sooner than 3 hours and no later than 24 hours after the application, as possible, after the application. At the discretion of Field Tech's as many random dip samples will be taken as is necessary to determine the overall efficacy of the application. Dip samples will be taken from a minimum of ten pre-chosen, fully recoverable dip stations after each application and recorded on an Aerial Larviciding Survey – Prostreatment form.

POLICY AND PROCEDURES FOR CATCH BASIN AND STORM WATER STRUCTURE APPLICATION (revised 1/03 1/07)

Catch basins and storm water structures will be inspected and treated according to the VMP and or the BMP of individual municipalities

INSPECTION: Technicians will inspect each Catch basin to make sure the basin is holding water or capable of holding water before treating basin. In the course of catch basin inspection and treatment technicians will inspect and treat as necessary storm water structures. The location and a brief description of the structure will be recorded on their Daily Report

APPLICATION: Technicians will wear all protective clothing, equipment, etc., that may be required by label direction when mixing, applying or otherwise handling any pesticide.
All pesticides will be used in strict accordance with label directions, pesticide regulations and application rates.

Altosid Pellets - will be applied at a rate of 7 grams or 0.25 ounces (2/3 of a table spoon) per basin.

Altosid WSP – will be applied at a rate of 1 packet per basin

Vectolex WDG - will be applied at a rate of 2 ounces per basin

Vectolex WSP – will be applied at a rate of 1 packet per basin.

Abate Pellets – will be applied at a rate of 7 grams or 0.25 ounces (2/3 of a table spoon) per basin.

5% Skeeter Abate - will be applied at a rate of 0.25 oz/ basin

CATCH BASIN REPORT: Technicians will complete a Catch Basin Street Sheet or Storm Water Structure Report and a Record of Pesticides Applied.

Record of Pesticides Applied - Altosid - to calculate "Total Finished Spray Applied" count the total number of basins treated on the Catch Basin Report and multiple by 0.25 to get total ounces applied

Example - 100 basins treated x 0.25 = 25 ounces applied.

Record of Pesticides Applied - Vectolex WDG - to calculate "Total Finished Spray Applied" count the total number of basins treated on the Catch Basin Report and multiple by 2 to get total ounces applied

Example - 100 basins treated x 2 = 200 ounces applied.

POLICY AND PROCEDURE FOR STORM WATER STRUCTURES (draft 1/03)

Current Strom Water Policy, adopted by the Massachusetts Department of Environmental Protection (DEP) in November 1996, calls for installation of storm water structures, wetland replication areas, and retention / detention ponds. Many of these artificially created habitats are situated in close proximity to human populations, continue to hold water long after natural areas have dried back and become prime breeding habitat for vector species mosquitoes. While storm water structures had been a concern of mosquito control, when put in perspective of other mosquito habitat they were not a priority. The rapid spread of these structures, especially in urban areas and the expanding threat of West Nile Virus have raised mosquito control concerns relative to these structures to a new higher level. Both Culex pipiens, the primary vector for West Nile Virus, and the recently discovered exotic species, Ochleratatus japonicus, not only thrive in man-made, highly polluted and organic habitats, they avidly seek these areas for the water qualities they exhibit.

Storm water structures may become blocked and ineffective due to a number of causes. In addition to silt, road sand, and natural debris that get washed into the structures, many have become dumping grounds for yard waste, Christmas trees, building debris, etc. This creates the highly organic and polluted conditions preferred by the vector species Culex pipiens and Ochleratatus japonicus. For this reason the District will

create a data base, prioritizing sites in order of mosquito breeding and or breeding potential and develop control strategies and protocol.

In the course of larviciding and catch basin treatments Field Technicians will inspect and treat as necessary storm water structures. Technicians will completed a Storm Water Structure Report. Reports will be forwarded to the Field Technician Specialist for further entry into the data base and further evaluation.

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

Wetlands: Teknar G #70051-73, Vectobac G #275-50, Vectobac CG #275-70, Altosid Pellets #2724-448-64833, Vectobac 12 AS #73049-38
Catch basins: Altosid WSP # 2724-448, Vetolex WSP #73049-20,5% Skeeter Abate #8329-15
Containers: Teknar G #70051-73, Vectobac G #275-50, Altosid WSP # 2724-448, Vetolex WSP #73049-20
Other (please list):

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

Wetlands: (Vectobac 12 AS 1qt./acre), (Teknar G, Vectobac G, Vectobac CG, Altosid Pellets 2.5 - 10 lbs/acre)
Catch basins: (Altosid WSP 7gr./basin), (Vectolex WSP 10gr./basin), (Altosid Pellets 0.25oz./basin), 5% Skeeter Abate 0.25 oz/ basin
Containers: (application rate / container type & size)
Other: storm water structures - (application rate / type & size)

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

☒ Larval dip counts – please list trigger for application: one or more per dip depending on type of mosquito, type of habitat, type of conditions.
☒ 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: To control amounts and species for management purposes and resident complaints

Please give the time frame for this program: one half hour after sunset to one half hour before sunrise (as conditions warrant)

Describe the areas that this program is used: Outdoors only in communities that participate in the NEMMC+WMD. As per city or town and residents request, as per individual cities or towns BMP and as advised by the NEMMC+WMD based on surveilance data and/or MDPH information or other applicable conditions.

Do you use:
☒ **Truck applications**
☐ **Portable applications**
☐ **Aerial applications**
☐ **Other (please list):**
Comments: _____

Please list the names of the products used with EPA #:
1). Anvil 10 + 10 # 1021-1688-8329
2). Suspend SC # 432-763
3).
4).
5).
6).

Please list your application rates for each product:
1). Anvil 10 + 10 - 0.42, 0.62, 0.21 fl oz. / acre ULV variable flow 15 mph 3.8 oz / min
2). Suspend SC - 1 oz./gal. 1 Gal / min (water mix)
3).
4).
5).
6).

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

Anvil 10 + 10 - 98.68 gal. Active Per Season
Suspend SC - 250.5 oz. Active 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 increaseing amount of disease carrying vectors

☒ Complaint calls - please list trigger for application 2 or more on street or neighborhood.
☒ Arbovirus data
☒ Best professional judgment

Comments: POLICY AND PROCEDURE FOR GROUND ADULTICIDING

Revised 1/98 1/06 3/06 1/07

General: Adulticiding applications shall be executed in accordance with the Districts Vector Management Plan (VMP) and/or individual municipalities Best Management Practice Plan (BMP) consistent with the provisions of The Generic Environmental Impact Report (GEIR) for mosquito control.

Ultra Low Volume (ULV) Applications: ground ULV applications will done by means of truck mounted ultra low volume (ULV) non thermal aerosol sprayers capable of delivering from 1 to 6 ounces per minute equating to 1 to 6 ounces per acre. ULV will be used for selective, targeted areas and wide area applications.

Selective, Targeted ULV Applications: Shall be done in response to either residents request or request from a municipal health department or board in accordance with that municipalities BMP. A minimum of two request from residents in the same vicinity are required to trigger an application of a street, section of a street, neighborhood, block or area or as otherwise requested by the health department or board.

Wide Area ULV Applications: Shall be done in response to surveillance data, multiple residents request, municipal health department or board request in accordance with that municipalities BMP. Or as recommended by the District in response to a specific vector/virus threat in accordance with the Districts VMP.

Time of Application: ULV applications will be conducted during evening hours, after dusk. If circumstances or conditions make an evening application impractical or unsafe then predawn application may be warranted.

Barrier Applications: Barrier applications will be done by means of Backpack or truck mounted barrier spray equipment capable of delivering 1 gallon per minutes. Barrier applications will be used to achieve control over a longer period of time and thereby reduce the need for repeated ULV applications. Barrier applications will be used on public use areas such as, parks, play grounds, athletic fields and school grounds in response to request from school officials and municipal health departments or boards in accordance with individual municipalities BMP or the Districts VMP.

Time of Application: Barrier spray applications will be conducted after dusk and before dawn.

Post-Application procedure: Technician will complete an Adulticiding Report and a Record of Pesticides Applied. Technicians, on their next return trip to headquarters, will submit reports, down load all GPS and computer data.

Disable ULV sprayer: When not in use all ULV sprayers will be disabled for security reasons.

***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: By hand, as needed, during inspections, treatments, ditch maintenance, OMWM or in conjunction with organized wetland clean ups.

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

Comments: _____

DITCH MAINTENANCE

Do you have a ditch maintenance program? Yes

Please check all that apply:
☒ Inland/freshwater
☒ Saltmarsh

If yes, please describe: Policy and Procedures for Mechanized Ditch Maintenance
Effective: January 1st, 2002
revised 1/1/04
MECHANIZED DITCH MAINTENANCE STANDARDS
INTRODUCTION
REVISED: 05-06-04 / 02-25-05 / 02-20-06
The original set of Ditch Maintenance Standards was written by the Essex County Mosquito Control Project (ECMCP) for their Ditch Maintenance Program. These Standards were specifically written as a reference tool for ECMCP staff to conduct standardized ditch maintenance activities in the field. They were developed and revised over the years to reflect the ECMCP's ever changing practices based on lessons learned in the field, suggestions provided for by regulatory and other representatives of the professional industry, current trends, evolving equipment sophistication, and increased knowledge of environmental response. These Standards have since been adapted to complement the Northeast Massachusetts Mosquito Control and Wetlands Management District's Policy and Procedures for Mechanized Ditch Maintenance, formerly the ECMCP and herein referred to as the District. The Northeast Massachusetts Mosquito Control and Wetlands Management District has designed the following Standards to incorporate the objectives of mosquito control and ditch maintenance activities while preserving the ecological integrity of freshwater wetland environments. The District continually strives to provide a more environmentally sensitive approach to fresh water wetlands management for mosquito control. This revision was also written in the best interest of keeping this District's activities in accordance with the Generic Environmental Impact Report. These Standards will not address individual wetland classes whereas, "there is no single correct, indisputable, ecologically sound definition of wetlands and because demarcation between dry and wet lies along a continuum" (Cowardin et al. 1979). Ditch maintenance activities will occur in both wetland and upland situations. Though not commonly practiced occasionally ditch maintenance will occur in salt marsh communities on a site specific basis. Ditch maintenance will be conducted by District personnel under the authority of Chapter 252 of the General Laws of the Commonwealth of Massachusetts and under the ditch maintenance exemption as provided for in Section 404 of the Clean Waters Act. Maintenance will occur in waterways that have been ditched or maintained previous to 1978 as determined by physical and or historical evidence. This interpretation of the 404 exemptions was the result of a 1988 review by the United States Army Corps of Engineers.

The Corps examined a varied sample of ditch maintenance projects completed over a five year period by the Essex County Mosquito Control Project, (now the District). The consensus of this review was that ditch maintenance activities for mosquito control in Essex County were generally implemented in compliance with the intent of the 404

exemptions and in accordance with 33 CFR 323.4 and 33 CFR 330.3 (a). Since then ditch maintenance projects have been conducted based on this interpretation of the 404 exemptions. Though not common the District may also conduct maintenance type activities such as dredging in waterways subsequent to 1978 as allowed for in accordance with the provisions of the Clean Water Act in 33 CFR Part 323.2 Definitions. (d)(3) The term discharge of dredged material does not include the following: (i –iii). According to the provisions of Chapter 252 the District has no authority in fresh water of those communities who do not subscribe to District Services. See Appendix for other legislation relevant to authority and exemptions for the District's ditch maintenance activities. The objective of these Standards is to provide a step-by-step guide to ditch maintenance procedures that reflect the intent of the 404 exemptions. The District's objective of ditch maintenance is to abate mosquito populations, decrease the potential for mosquito larval habitat and reduce the need for insecticides as part of an integrated pest management, (IPM) strategy.

Let It Be Known

The District only speaks for itself and this document reflects the District's policies and procedures alone. Ditch Maintenance Programs and corresponding Standards vary from Mosquito Control Project to Mosquito Control Project and should reflect each Project's specific mosquito control concerns, species, habitat, socio-economic needs, available equipment and inhouse expertise. The District does not represent any other Mosquito Control Projects on this subject nor does this document necessarily reflect any of the other Mosquito Control Projects' Ditch Maintenance Programs.

BEAVER ACTIVITY AMENDMENT

REVISED: 01/07/04, 02/23/05, 11/08/05

INTRODUCTION:

Since the adoption of the anti-trapping ballot referendum in 1996, the beaver population in Massachusetts has nearly tripled. Waterways subject to beaver activity are often altered from free flowing systems to large, slow or no flow systems. As a result, many areas adjacent to wetlands have now become flooded, resulting in the potential of increased breeding habitat for mosquitoes. The District has established a pilot program to investigate the relationship between mosquito breeding habitat and beaver habitat; their potential impacts on increased mosquito populations and mosquito borne viruses and their relevance to human populations.

PETITION:

Municipalities may petition the District to investigate locations associated with beaver activity in accordance with the District's Wetlands Management Policy and Procedures. Petitioned sites such as wetlands or waterways that have been altered due to beaver activity will be evaluated in accordance with the District's Standards for Ditch Maintenance.

OPTIONS:* Upon determination that mosquito breeding or a potential for mosquito breeding exists, site work beyond the scope of the District's Standards for Ditch Maintenance may be required as follows:

A. Trapping: Removal of beavers from an area prior to beginning any ditch maintenance. Trapping will be done by certified District personnel.

B. Ditch Maintenance: Dams, dikes, blockages, etc. may be cleared from existing ditches to manage the level of water within a wetland or waterway in order to complete projects safely and efficiently.
OPTIONS: (CONTINUED)

C. Water-Flow Devices: Water-flow devices may be installed to maintain a desired level of water within a wetland or waterway while still allowing beavers to remain in the system.

* Site work conducted on beaver impacted wetlands and waterways will be performed in full cooperation and partnership with the Massachusetts Division of Fisheries and Wildlife as well as the petitioning municipality.

FACT SHEET # 10.

Open Marsh Water Management

History: OMWM was originally developed in New Jersey as an environmentally sensitive alternative to grid ditching salt marshes and has also been used in the Mid Atlantic States for many years. In 1982 a collaborative effort with mosquito control, the Town of Rowley Massachusetts, the Manomet Bird Observatory and the Massachusetts Audubon Society in a 3 year study of OMWM. Based on the principles established in New Jersey and the Mid Atlantic States a standard was developed specific to the needs of the salt marshes of New England.

Objective: The objective abate mosquito population, reduce the need for insecticides, enhance the tidal food web and restore previously ditched, altered or degraded salt marshes.

Principle: OMWM is a site specific management technique that uses existing features of a salt marsh to create or enhance ponds, pools and pans to serve as reservoirs for mosquito eating fish and habitat for water fowl and wading shore birds and provides access for the fish to mosquito breeding areas by creating or enhancing radial connectors.

Standards: OMWM is done in strict accordance to the standards for OMWM. The standards are a step by step procedure that is followed to implement OMWM projects.
Sites are monitored before work is done and established criteria must be met. The standards define the types of alteration which are acceptable. Sites are monitored for two years after work is completed.

Site Plan: After a site is monitored and criteria is met, this data is analyzed and alteratons are designed on site and a plan is developed. The site plan is an aerial photograph with a transparent overlay depicting alterations.

Alterations: Designed alterations are implemented by highly specialized, environmentally sensitive, low ground pressure equipment.

Restoration: It is estimated that 3,000. miles of grid ditch were excavated by hand in Essex County between 1929 and 1934. These ditches severely altered and degraded salt marshes. OMWM has demostrated the ability to restore salt marsh, and manage Phragmites growth, which has led to partnerships with numerous Federal, State, and private groups to restore coastal salt marshes.

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 8882'
Mechanized cleaning 1626'
Other (please list):

Comments: _____

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

Hand cleaning

Mechanized cleaning

Other (please list):

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

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: **Two Biological materials Vectobac 12AS and Vectobac G were used as larvicides on the Salt Marsh. Vectobac 12AS, a liquid BTI was the material used in our Aerial applications with an efficacy rate average of 96.81%using Pre and Post application dat from various site locations. Vectobac G, a dry granular form of BTI was used for hand treatments with an efficacy of 100%.**
Larvicide – catch basins:
Larvicide-hand/small area
Catch Basins

Catch basin mosquito breeding was monitored beginning in late April and continued throughout the breeding season as determined by larval counts. Samples were taken from catch basins throughout the District and reared in the laboratory to determine the efficacy of and duration of efficacy of larviciding products. Catch basin counts were low in 2009 due to the number of and duration of rain events. Efficacy for all catch basins tested fell between 91% - 100% efficacy in growth to adult stages. Product efficacy averaged 2 – 3 months from date of application.

Hand/Small area

Data was collected by District technicians prior to treating sites containing mosquito larvae. Data was again collected by the District Biologist within 24 hours of treatment to determine the efficacy of the products used in freshwater. Efficacy for all sites fell between 87% - 100%. Sites with lower efficacy ratings typically held larvae in later growth stages where feeding has diminished or ceased altogether.

Ground ULV Adulticide: **Efficacy tests for adulticiding products were not conducted in 2009. Field trials will be scheduled during the 2010 mosquito breeding season to test all adulticiding products currently used by the District.**
Source Reduction:
Open Marsh Water Management:
Other (please list): **VectoMax is a combined formulation of products currently used by the District (Bacillus thuringienis ssp. israelensis and Bacillus**

sphaericus). Samples were taken from 40 catch basins throughout the District and reared in the laboratory to determine the efficacy of and duration of efficacy of VectoMax. Efficacy for catch basins tested fell between 94% - 100% efficacy in growth to adult stages. The product continued to maintain a high efficacy rate through 2 ½ months after application with a slight increase in the number of adults hatching off thereafter. A number of basins in the study experienced a dry back during the test period. However, the product continued to provide mosquito larval control after reflooding during late summer rain events and throughout the end of the study.

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

OPEN MARSH WATER MANAGEMENT

Do you have an OMWM program? No

If yes, please describe:

Please give an estimate of total square feet or acreage:

What time frame during the year is this method employed?

Comments: Awaiting Permit

***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: none

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

☒ Gravid traps	
☒ Resting boxes	
☒ CDC light traps	☐ Canopy
☒ CDC light traps w/CO_2	☒ Canopy
☐ ABC light traps	☐ Canopy
☐ ABC light traps w/CO_2	☐ Canopy
☐ NJ light traps	☐ Canopy
☒ NJ light traps w/CO_2	☐ Canopy

Other (please describe):

Please describe the purpose of this program: To monitor population levels and species / locations for management purposes and public health testing

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

If yes, please describe how you chose these long-term sites. focal point, location, accesability, type, security, power access
FACT SHEET #5

Adult Mosquito Surveillance

General: There are many different species of mosquitoes. The District has collected 47 different species in our area, of these there are around 12 mosquito species important to human health, nuisance and quality of life. All mosquitoes species have one thing in common, the female must have a blood meal before she can lay eggs. Different mosquitoes have different breeding habitat and host seeking behavior. The key to managing mosquito populations efficiently and effectively is understanding the interaction between mosquitoes and human populations. Adult Mosquito Surveillance is the means by which we gather this information which is then used in determining operational strategies.

Light Trap: A light trap is a device used to collect adult mosquitoes. It consist of a fan, a light, a Carbon dioxide dispensing device and a collection net. Female mosquitoes looking for a blood meal are attracted to the C02 and are drawn into the net by the fan. The District has one light trap in each member municipality in a fixed location. This fixed location LT is useful in monitoring long term trends and the effectiveness of control measures as well as short term events which require response. The District also has portable traps which can be deployed at short notice in response to data from fix LT, complaints or vector surveillance.

Gravid Trap: A gravid trap is a device used to collect a particular species of mosquito. It consist of a pan of highly organic water and a collection chamber which bridges the pan of water. Some mosquito species lay their eggs in artificial container such as catch basins and prefer highly populated or organic water. Female mosquitoes landing on the surface of this water to deposit eggs are drawn into the collection chamber by the Fan. The District has one gravid trap in each member municipality in a fixed location. This fixed location GD is useful in monitoring long term trends, the effectiveness of control measures and vector surveillance. The District also has portable traps which can be deployed at short notice in response to data from fix LT, complaints or vector surveillance.

Resting Boxes: A resting box is a device designed to collecting blood fed female Culiseta melanura mosquitoes who are the principle vectors of Eastern Equine Encephalitis Virus, EEE. Resting boxes have demonstrated to be an efficient and affective tool. Most of the EEE virus isolations in the District to date were from mosquitoes collected in resting boxes. EEE outbreak cycles in Northeast Mass cannot yet be predicted. Therefore resting boxes will continue to be deployed in areas of concern using historical data as indicators.

Landing rates counts: A landing rate count is exactly what it sound like. A Field Technician counts the number of mosquitoes which land on an exposed arm for one to five minutes, The mosquitoes can be collected in a device called an aspirator for species identification. this method is often used in response to a specific complaint and is useful in determining the source of the mosquito problem.

Species Identification: Live mosquitoes from fix location light traps, gravid traps and resting boxes are collected twice weekly from around May 1st. to September 30th.. Mosquitoes are identified and samples sent to the Massachusetts Department of Public Health were they are tested for virus.

.VECTOR MANAGEMENT PLAN

2009

Introduction: According to the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (CDC), the introduction of West Nile Virus (WNV) in 1999 to the northeast United States raised the issue of preparedness of public health agencies to handle outbreaks of vector borne disease. CDC states "mosquito control is the most effective way to prevent transmission of WN" and "the most effective and economical way to control mosquitoes is by larval source reduction through locally funded abatement programs" (Morbidity and Mortality Weekly Report: January 21,2000).

Mosquito control districts or programs while considered state agencies are unique as we are directly accountable to our member communities. As such, the needs and concerns of those communities drives operational policy and strategies. For several years now our program has been in transition from what once was considered a primarily nuisance mosquito control program, to a primarily public health based program. WNV is now endemic to the northeast and since 2004 Eastern Equine Encephalitis has a presents here as well. World wide mosquito borne virus is on the increase. While the line between what might be considered nuisance control as opposed to what is public health mosquito control has always been at best obscure, it is now nonexistent. Consider the World Health Organization (WHO) definition of health “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. It is not a stretch to say that shear numbers of mosquitoes that affect quality of life is not just a nuisance but in fact a health issue. The Federal

Insecticide, Fungicide and Rodenticide Act (FIFRA) section 2 (00) defines the term "vector" as "any organism capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including mosquitoes…" This make it clear that by definition all mosquitoes are potential vectors and all mosquito control activities are in the interest of public health.

The purpose of this VMP is to target specific responses to specific risk and direct our limited resources effectively and efficiently.

Regional Adult Mosquito Surveillance: The District will continue its surveillance of mosquito vectors based on protocols established by the Massachusetts Department of Public Health (DPH). The District's Surveillance Program will operate and maintain 32 CO2 baited New Jersey traps (NJ traps) across the region at fixed locations. NJ traps are used to sample the general adult mosquito population to determine dominant human biting mosquitoes and disease carrying species together with their population densities and because they are at the same location every year. Population trends can be compared during the year and between years. One NJ trap will be placed in each member municipality. Additional portable traps may be used as necessary, in response to areas with disturbing population trends and virus activity. The District will collect and identify samples from each trap twice a week.

The District will operate 32 gravid traps. Gravid traps are designed to collect recently blood fed adult female Culex mosquitoes and other container breeding species relevant to WNV transmission. One gravid trap will be placed in each member municipality in a fixed location and additional portable gravid traps may be used as necessary in response to areas with virus activity. The District will collect and identify samples from each trap twice a week.

In 2009 we will be operating between 60 and 80 resting boxes in one tier in the primary risk area immediately bordering NH. We will continue to do this for the foreseeable future in order to establish the pattern of EEE cycles in our service area and to serve as a early warning system. It is important to note that we can redeploy additional resting boxes in short order if necessary.

Six to eight resting boxes will be placed at each fixed location and there will be two locations in each of the municipality bordering NH with the exception of Salisbury, which will have just one location. The District will collect and identify samples from each box twice a week.

Last year the District initiated a pilot program of deploying a new type of trap called the "BG Sentinel trap". These traps have shown to be more effective in attracting Aëdes albopictus, commonly called the Asian Tiger Mosquito. Aë. albopictus is a principal vector of Chikungunya, which is a virus causing severe headache, chills, nausea, vomiting, and extremely persistent and painful arthritic joints which may persist for weeks to months.

Fortunately we did not identify any Aë. albopictus from these traps. Our experience with these traps was disappointing as they did not perform well. For this reason continued deployment of these traps regional would not be practical. Having said that, the potential public health implication posed by Aë. albopictus is of such important it is still our intention to develop an early warning surveillance system. In 2009 we plan on deploying one or two of these traps in specific locations to see if we can fine tune these devices to work more efficiently and make comparison with other alternatives we may develop.

Emergent Exotic and Recent Immigrant Mosquito Species: Also through our Surveillance Program, we will be on guard for the appearance of new mosquito species. Within the past five years, we have seen the appearance and rapid spread of an exotic species, Aedes japonicus, the "Japanese Rock Pool Mosquito", throughout our District. While this species is a competent disease vector in other areas, there is little to suggest it is currently a disease vector in the Northeast.

Another competent disease vector, the "Asian Tiger Mosquito", Aedes. albopictus, first found in Houston in 1985, has spread rapidly throughout the temperate regions of the U.S., including southeastern Massachusetts. Although this species has yet to be collected in our district, The possibility of its arrival is very real and its potential as a disease causing agent should not be underestimated. In 2007 District personnel collected specimens believed to be Ae. albopictus and as previously addressed in the surveillance section of this VMP a pilot program to confirm the presence and distribution of Ae. albopictus began last summer and will continue the year.

Therefore, the possibility of additional mosquito species establishing in our area, some even more effective at transmitting virus and other disease causing agents can not be dismissed. Thus, our Surveillance Program will aggressively monitor mosquitoes we collect, not only to measure unusually high populations, but also to detect any new species.

Virus Testing: Specimens from our trap collections will be sent weekly to Department of Public Health to be tested for the presence of encephalitis viruses. The District has a cooperative agreement with DPH to increase the number of pools tested.

Emergent Virus: Since its introduction in New York City in 1999, WNV has spread through out the country and is now endemic in the Northeast. Prior to 2004 there were no serious concern about EEEV in the Essex County. This has changed with multiple EEEV isolations in mosquitoes in recent years. World-wide the threat of mosquito-borne disease is on the rise and the possible introduction of other exotic vector borne disease must be seriously considered. Through our affiliations and associations with the scientific and mosquito control community world-wide we will monitor this potential on behalf of our member municipalities. Potential the next mosquito bourn virus of concern is Chikungunya. There is currently a Chikungunya pandemic in countries along the Indian ocean basin (and with nearly 2 million people infected). An Chikungunya

epidemic broke out in northern Italy in September of 2007 (with over 200 cases); the Italian epidemic is the first known outbreak of this virus outside the tropics.

While Chikungunya is rarely fatal it has the potential to infect large numbers of people. In 2005 and 2006 it sickened almost one third of the 800,000. inhabitants of La Reunion, a French island in the Indian Ocean (Science 24 February 06 p.1085). Last Summer 200 people in Italy were infected, this is the first known example of Chikungunya transmitted outside the tropics. According to Dr. Randy Gaugler, Center for Vector Biology, Rutgers University it is likely we will have out breaks of Chikungunya within the next five years.

Another virus of concern is Rift Valley fever (RVF). RVF is a fast-developing ("acute") fever causing mosquito-borne viral disease that affects livestock animals and humans. Whereas many infected persons do not exhibit symptoms, others develop fever, generalized weakness, back pain, dizziness and extreme weight loss at the onset of illness. Some suffer a mild Illness with liver abnormalities while a small percentage may suffer hemorrhagic fever. Approximately 1% - 10% of affected patients may have somepermanent vision loss. Approximately 1% of humans that become infected with RVF die of the disease. There is no established treatment for infected patients and there is neither a cure nor a vaccine currently available.

RVF was first identified in 1931and has historically been confined primarily in eastern and southern Africa. However, in 2000, there was ab outbreak of RVF in the Arabrain peninsula and since then, there has been concerns of RVF spreading into North America.
The virus is transmitted primarily via floodwater mosquitoes (Aedes species). While no mosquitoes in RVF endemic regions are found in the US, several common species have been infected experimentally and at least one species found in Massachusetts has demonstrated the ability to infect laboratory animals.

Through our affiliations and associations with the scientific and mosquito control community world-wide we will monitor this potential on behalf of our member municipalities. Necessary and appropriate vector/virus intervention measures will continue to be developed and implemented.

West Nile Virus

Introduction: According to the CDC, since 1999 WNV has infected 27,551 people killing 1,077. 11,036 have been inflicted with Encephalitis, 15,814. with serious and longer than normal fever and 701 with other clinical disorders. While it was previously though that neurological disorders associated with WNV were short-lived and only affected a small percentage of those infected, recent studies suggest that neurological disorders may be more prolonged, serious and effect more victims then original thought. WNV, primarily an avian virus has been far deadlier for birds with dramatic declines in seven species (Kilpatrick et al. 2007 The Ark.124 [4]: 1121-1136). WNV has had a devastating ecological impact and Avian populations have yet to recover.

Culex species are primarily responsible for the amplification of virus in birds and are vectors to humans in endemic areas. A recent study by Dr. Ted Andreadis with the Connecticut Agricultural Station in Conjunction with The Massachusetts Department of Public Health and with the corporation of mosquito control programs in Massachusetts, Connecticut and New York found through DNA testing of blood feed mosquitoes that Culex salinarus feed on mammals 55% of the time. This supports an earlier study by Dr. Andreadis that suggest that Culex salinarus may be the primary vector of WNV.

While Culex salinarus can be present in catch basins, this is not its preferred breeding habitat and for this reason our successful early intervention strategy of treating catch

basin early in the season to reduce Culex pipiens/restuans populations and therefore reduce virus amplification in birds prior to human exposure will continue.

Culex pipiens/restuans breed in highly organic or polluted water that collect in artificial containers such as catch basins and storm water structures including detention and retention ponds, as well as discarded tires, gutters, bird baths, etc. The preemptive strategy of treating catch basins has been effective at reducing the mosquitoes responsible for the amplification of virus and to some degree vector species and thereby effective in reducing public health risk.

Our surveillance data shows an 80% reduction in Culex species in communities where basins are treated as compared to communities with untreated basins. In a study conducted in Portsmouth NH in 2007 by Municipal Pest Management Services, Inc demonstrated a 75% reduction in treated basin compared to untreated basin and that 92% of the mosquitoes breeding in catch basins are Culex pipiens/restuans.

Contrary to what one would think, drought does not deter breeding of Cx pipiens but instead may enhance it! Wetlands areas dry back and pools become more concentrated with organic debris, providing Culex with additional breeding habitat. Also during droughts, catch basins continue to accumulate water from car washing, lawn watering and concentrated sheet flow from minor rainfall events, etc. Targeting Culex in basins will reduce adult Culex populations, hence bird-to-bird virus transmission and therefore, reduce risk to humans.

As we previously expected, while Culex salinarus may be present in catch basins, this is not its preferred breeding habitat as demonstrated by the Portsmouth study which showed only 5% of mosquitoes collected from basins were Culex salinarus.

Waste Water Treatment Facilities Inspection: As a preemptive strategy the District will request to inspect all waste water treatment facilities in an effort to reduce or eliminate Culex breeding or potential breeding in these facilities. While the District is authorized under the provisions of chapter 252 section 4 of the General Laws of The Commonwealth to enter upon lands for the purpose of inspections, we are not a

regulatory agency. Nor is it our intention to cause any imposition to the management of waste water facilities, but rather to be a resource for information and technology to assist waste water facilities managers in preventing and or abating mosquito breeding to the mutual benefit of the facility, the community and mosquito control.

Catch basin treatment in 2009 will be prioritized as follows: As previously stated WNV is now endemic to the northeast and it has become clear that the epee center for our area is the urban coastal communities of Winthrop, Revere, Lynn, Nahant, Saugus, Swampscott, Marblehead and Salem. Second in order of priority will be Beverly and Danvers.

Property Inspection: Socioeconomics often plays an important role in mosquito control and associated public health risk. This is evident by a study conducted in 2007 enti"Delinquent Mortgages, Neglected Swimming Pools, and West Nile Virus, California" which demonstrates a 276% increase in the number of human WNV cases in the summer of 2007 associated with a 300% increase in foreclosures which led to a large number of neglected swimming pools in Bakersfield, Kern County. Last year we received several request from Boards of Health to inspect abandoned properties.

While the district has a long standing policy of property inspections at the request of Boards of health, in the past we have taken a passive approach to property inspection. Given the current economic climate and likelihood of increasing property abandonment and the potential for increased health risk associated with property abandonment the district in 2009 will take a more aggressive approach to property inspections. In the course of our routine activities in your community we will be on the lookout for such properties and report such properties to Boards of Health. We understand that addressing concerns related to such properties is a matter of time and process.

In the Long term we will offer any support that may be appropriated to resolve mosquito problems related to such properties and in the short term with the Boards of Health's support we will implement the necessary control measures to mitigate the immediate mosquito problem associated with such properties.

Selective Ground Adulticiding: As a preemptive measure the District may recommend selective and targeted adulticiding applications to reduce Culex populations when WNV isolations in mosquitoes are discovered. The District may recommend a target application based on the following criteria; two or more WNV isolations in mosquitoes in close proximity; one or more human cases of WNV.

Barrier Treatment: The District uses a system called Ultra Low Volume (ULV) for ground adulticiding applications. ULV is designed to dispense very small amounts of pesticides over a large area. While this is a cost effective means of reducing mosquito populations on a large scale, it only affects those mosquitoes present at the time of the application and repeated applications are sometimes necessary to sustain the initial reduction in the mosquito population in some areas. To reduce the need for repeated applications and provide more sustained relief from mosquitoes in high public use

areas, the District may recommend a barrier spray treatment to public use areas such as schools (applications to schools must be incompliance with MGL ch85), playgrounds, athletic fields, etc. A barrier spray may reduce mosquitoes for two or more weeks. The District strongly recommends member municipalities take advantage of this service.
tled

Eastern Equine Encephalitis Virus

Introduction: From what we have learned over the past four years it is apparent that EEEV emanates from the Southern New Hampshire area, in particular Exeter, Kingston and Newton. There has been EEEV activity in these towns from the beginning of the current cycle in 2004 to the present. It appears that EEEV "migrates" south from this focus area to the Northeast Massachusetts area.

While there were EEEV isolations in mosquitoes and human cases in NH in 2007 there was no EEEV activity in our service area we did recommend and conduct adulticiding application in Amesbury, Merrimac and Haverhill as a preemptive measure due to spikes in mosquito vector populations. We do not anticipate any EEEV activity in our service area in 2009 but are prepared for any contingence.

Habitat Surveillance: Through the winter months the District will continue to locate, identify and enter into our data base potential Culiseta melanura habitat in communities bordering New Hampshire, specifically Amesbury, Merrimac Methuen and Haverhill.

Also in the communities of Boxford and Hamilton.

Selective Ground Adulticiding: As a preemptive measure the District may recommend selective and targeted adulticiding applications to reduce Culiseta melanura populations in an effort to break the virus cycle in bird-to-bird transmission phase.
Often by the time EEE appears in horses and humans other mosquito species, the so called "bridge vectors" are targeted for adulticiding; but it is late in the season when intervention efforts are made and are limited at best and often nonexistent. The District will recommend a targeted adulticide application based on the following criteria: Above average Culista melanura populations in a year of anticipated EEE activity; one or more EEE virus isolations in mosquitoes; one or more EEE virus isolations in horses; one or more human EEE cases.

Barrier Treatment: The District uses a system called Ultra Low Volume (ULV) for ground adulticiding applications. ULV is designed to dispense very small amounts of pesticides over a large area. While this is a cost effective means of reducing mosquito populations on a large scale, it only affects those mosquitoes present at the time of the application and repeated applications are sometimes necessary to sustain the initial reduction in the mosquito population in some areas. To reduce the need for repeated applications and provide more sustained relief from mosquitoes in high public use areas, the District may recommend a barrier spray treatment to public use areas such as schools (applications to schools must be incompliance with MGL ch85), playgrounds,

athletic fields, etc. A barrier spray may reduce mosquitoes for two or more weeks. The District strongly recommends member municipalities take advantage of this service.

Emergency Response Aerial Adulticiding Plan (ERAAP): In the event that the risk level escalates to a point were it is deemed that ground adulticiding is insufficient to reduce that risk an emergency aerial adulticiding application may be warranted.

This would require a consensus of the District, the State Reclamation and Mosquito Control Board, the Massachusetts Department of Health, an independent advisory board and a declaration of a Public Health Emergency from the Governor.

Typically, once the decision is made to do an aerial application the need is immediate and window of opportunity is short. It is imperative that the complex logistics of executing the application are in place, hence the ERAAP. ERAAP consist of continually revised Global Positioning Satellite GPS mapping program, which can be downloaded into aircraft navigation systems to direct aircraft as to where to spray. Memorandums of Understandings with designated airports have been formalized to insure operational staging areas and ground support facilities are available and ready. Contracts with aerial applicators and insecticide suppliers are in place for rapid delivery and deployment. With all these factors all ready addressed and accounted for, aerial applications can commence very soon after the Public Health Emergency is declared.

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

- ☒ *Ae. albopictus*
- ☐ *Ae. cinereus*
- ☒ *Ae. vexans*
- ☒ *An. punctipennis*
- ☒ *An. quadrimaculatus*
- ☒ *Cq. perturbans*
- ☒ *Cx. pipiens*
- ☒ *Cx. restuans*
- ☒ *Cx. salinarius*
- ☒ *Cs. melanura*
- ☒ *Cs. morsitans*
- ☐ *Oc. abserratus*
- ☒ *Oc. canadensis*
- ☒ *Oc. cantator*
- ☐ *Oc. excrucians*
- ☐ *Oc. fitchii*
- ☒ *Oc. j. japonicus*
- ☐ *Oc. punctor*
- ☒ *Oc. sollicitans*
- ☐ *Oc. stimulans*
- ☐ *Oc. taeniorhynchus*
- ☒ *Oc. triseriatus*
- ☐ *Oc. trivittatus*
- ☐ *Ps. ferox*
- ☐ *Ur. sapphirina*

☐ Other (please list):

Do you participate in the MDPH Arboviral Surveillance program? Yes

How many pools do you submit weekly on average? 60

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

☒ West Nile Virus
☒ Eastern Equine Encephalitis
☐ Other Please list:

Did the above listed diseases cause human or horse illnesses? Yes

Please explain: Horse in Peabody.

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

WNV: #3 district
EEE: #3 border NH, #2 inland, #1 coastal

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

WNV: #3 district

EEE: #5 Merrimac & Amesbury, #3 Methuen & Salisbury, #2 inland, #1 coastal

What time frame during the year is this method employed? May till October

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: POLICY AND PROCEDURE FOR EDUCATIONAL OUTREACH

General: The District will promote and provide educational outreach on mosquito control and related environmental science to schools, civic organization and public officials.

Website: The District will maintain a Website www.nemosquito.home.comcast.net which will provide general information about operational strategies and procedures.

Other Media: the District has various DVD's available which will be provided to schools and civic groups, etc. at their request.

Outreach Programs: During the off season the Districts Entomologist and /or Biologist will present educational programs tailored to the specific needs of schools, civic organization and public officials. This includes

Greenhead Presentation (Ipswich Historical Society) 2-1-09

Greenhead trap assistance (Maine), Plastic Barrel offering to city/towns

NMCA (Esteban, Robyn)

BOH Arbovirus annual presentation

Tick presentation

Paper presentation MCD Wetland Mgmt. + Restoration Specialists

Please check off all that apply:

☒ School based program
☒ Website
☒ PR brochures/handouts
☒ Community events
☒ Science fairs
☒ Meeting presentations
☒ Other (please describe): As requested by school / town / associations / agencies / board of health ect.

Please give an estimate of attendance/participants in this program: 10-250

Please list some events you participated in for the year of this report: NMCA, Florida Mosquito Control Assoc., NJMCA, AMCA

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

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

If yes, please elaborate on your research projects: BGS Ground testing, Efficacy, Greenhead trap design comparison

Are you involved in any collaboration with academia, industry, environmental groups, etc.? Yes

If yes, please elaborate on your collaborations this past year: Greenhead and trap presentation (Ipswich Historical Society), Greenhead Trap Assistance (Maine), Plastic Barrel offering to cities and towns.

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

Does your staff participate in educational opportunities? Yes

If yes, please list the training and education your staff received this year: NMCA Annual Conference, Clarke Mosquito Control annual seminar, NHESP training, AMCA, NJMCA, SMDR workshop PRWR,Erosion and Sedimentation Control, Stream Bank Stabilization and Stream Restoration, River Morphology, Spring Ephemerals workshop, Merrimac River Watershed Council Map Program and Stream Team, Wildlife Habitat Surveys.

Please list the certifications and degrees held by your staff: Doctorate, Bachelor, Associate degree

Comments: _____

BIOLOGICAL CONTROL EFFORTS

Do you have a biological control program? Yes

If yes, please describe: Ditch Maintenance, Salt Marsh Ditch Maintenance

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

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: Beginner in training

Please describe your current GIS abilities: Beginner

Give details if possible on your GIS abilities: our employees are currently training and developing capabilities.

Please describe any changes/enhancements in this area from the previous year: More laptops used in trucks to aid in adulticide truck spraying. Developing data collection in other aspects of mosquito control

Comments:

REVENUES & EXPENDITURES

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

GG - Energy costs, utilities $67,100.00 Wright Express $55,000.00
Fleet Response $5,000.00
National Grid $6,000.00
Osterman Gas $3,000.00
Dennis K. Burke $3,000.00
Town of Andover $100.00

HH $0.00 $0.00

II - Litigation $0.00 $0.00

JJ - Progammatic Operational $10,000.00 ArcSource $7,000.00
Bresnaham Ice $2,000.00
MHQ $1,000.00

KK - Capital Equipment $44,358.07 $44,358.07

LL - Telp Lease/Maint&Repair $99,551.89 Adapco $1,500.00
Brake & Clutch $3,000.00
Coady's Towing $5,000.00
Gunderson Welding $3,000.00
Kassbohrer $20,000.00

Tech Hydraulics	$2,000.00		
4th of 4 payments Ford 350	Telp # 863	Koch Financial	$11,174.92
4th of 4 payments Kass 270	Telp # 862	Koch Financial	$18,499.93
3rd of 3 payments F150 Van	Telp #	Koch Financial	$19,232.00
3rd of 5 payments Kass 260	Telp # 908	Koch Financial	$14,145.04

NN - Repairs/Pesticides	$250,500.00	Adapco	$20,000.00
Allied Waste	$1,500.00		
Clarke Mosquito	$120,000.00		
Community News	$1,000.00		
Home Depot	$8,000.00		
JBI Helicopter	$100,000.00		

UU - Info Tech / Communications	$32,530.00	AT&T	$200.00
Comcast	$830.00		
Nextel	$5,000.00		
True North Mapping	$25,000.00		
Verizon	$1,500.00		

Total Spending	$1,527,199.00	$1,527,199.00
Budget	$1,527,199.00	$1,527,199.00
Surplus		
Deficiency		
Projected FY07 Surplus		

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

Comments:

Amesbury	**$40,319**
Andover	**$108,123**
Beverly	**$65,767**
Boxford	**$69,328**
Danvers	**$51,597**
Georgetown	**$38,492**
Groveland	**$26,757**
Hamilton	**$43,660**
Haverhill	**$109,724**
Ipswich	**$95,699**
Lynn	**$55,489**

Lynnfield	**$35,871**
Marblehead	**$32,957**
Merrimac	**$25,067**
Methuen	**$77,537**
Middleton	**$46,506**
Nahant	**$6,406**
N. Andover	**$86,562**
Newbury	**$68,013**
Newburyport	**$35,164**
Peabody	**$71,910**
Revere	**$34,492**
Rowley	**$52,054**
Salem	**$39,671**
Salisbury	**$45,542**
Saugus	**$44,876**
Swampscott	**$18,349**
Topsfield	**$37,874**
Wenham	**$23,228**
W. Newbury	**$38,264**
Winthrop	**$13,294**

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 WSP
EPA Reg. #: 2724-448
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 685.3 lbs.
Comments: _____

Product Name: Vectolex WSP
EPA Reg. #: 73049-20
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 24.52 lbs
Comments: _____

Product Name: 5% Skeeter Abate
EPA Reg. #: 8329-15
Application method: hand

Targeted life stage: Larvae
Total amount of concentrate applied: .92 lbs
Comments: _____

Product Name: Vectobac G
EPA Reg. #: 73049-10
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 1267.5 lbs.
Comments: _____

Product Name: Vectolex CG
EPA Reg. #: 73049-20
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 29.97 lbs.
Comments: _____

Product Name: Teknar G
EPA Reg. #: 70051-73
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 53.8 lbs
Comments: _____

Product Name: Vectobac 12 AS
EPA Reg. #: 73049-38
Application method: Aerial
Targeted life stage: Larvae
Total amount of concentrate applied: 1785 gal.
Comments: _____

Product Name: Anvil 10 + 10
EPA Reg. #: 1021-1688-8329
Application method: ULV
Targeted life stage: Adult
Total amount of concentrate applied: 98.68 gal,
Comments: _____

Product Name: Suspend SC
EPA Reg. #: 432-763
Application method: ULV Barrier (retro fit)
Targeted life stage: Adult
Total amount of concentrate applied: 250.5 oz
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? Yes

If yes, please elaborate INSPECTIONAL SERVICES

The old saying an ounce of prevention is worth a pound of cure is very true in mosquito control. Early intervention or preemptive action to prevent a potential mosquito breeding site from becoming an actual mosquito breeding site is as much a control strategy as an application or treatment to an actual breeding site and often an existing mosquito breeding problem can be easily corrected. While the District is authorized under the provisions of chapter 252: section 4 of the General Laws of the Commonwealth to enter upon lands for the purpose of inspection it is not a regulatory agency. Nor is it our intention to cause any imposition on any citizen or business, but rather to be a resource for information and technology to help property owners prevent or abate mosquitoes to the mutual benefit of the property owner, the community and mosquito control.

The District acts as a technical advisor as requested by the Board of Health and represent the municipalities public and animal health and human annoyance concerns relative to mosquito breeding, potential breeding and proposed development. The District, at the request of the board of health will also review site plans and inspect sites were storm water structures are planned or in the process of constructed. Upon inspection of a site the District will make written recommendations, submit these recommendations to the board of health and cc the land owner.

The primary vector species of West Nile Virus, Culex pipiens usually breeds in artificial containers such as, catch basins, storm water structures, etc. In particular this species seems to thrive where others fail, due to their ability to survive in highly organic and polluted water These conditions are often associated with industrial or office parks, commercial or agricultural livestock facilities. Because of the potential for Culex species mosquito breeding, the primary vector of West Nile Virus in and around industrial or offices park, agricultural and livestock facilities the District will routinely inspect such areas.

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: In compliance with the districts Ditch Maintenance Policy - Pettitioned by the town (BOH)

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

If yes, please elaborate: In compliance with the districts Ditch Maintenance Policy - Pettitioned by the town (BOH)

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

If yes, please elaborate: Sand and siltation removal in Methuen, Lynnfield - stream restoration in Rowley - .Pipe and headwall restoration in Nahant

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

If yes, please elaborate: Yes,

OMWM workgroup,
Clarke 2009 Community Mosquito Control Update 04-28-09
Northeast Vector-Borne Disease & Personal Protection Techniques 04-28-09
Chainsaw training and field equipment day 10-15-09
NMCA Annual Meeting Sturbridge, MA 12/2 – 12/4/09
Epidemiology short courses (Florida)
Short Hydroperiod Vernal Pools
MAPP Program
NHESP Vernal Pool Cert.

CHILDREN AND FAMILIES PROTECTION ACT

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

If yes, please explain: Not able to address mosquito control in a timely fashion due to protocols and compliance.

If you have data on compliance with this Act and your program, please list here: We send a notice to schools and school systems each year addressing compliance issues and assist in any way we can to help them comply.

If you had difficulties with implementation of your program due to this law, please elaborate here: Due to increased health risks with mosquitos, it puts more of a demand on Mosquito Control Agencies. Complying with School property issues is a constant challenge.

Comments:

GENERAL COMMENTS

Please list any comments not covered in this report: _____