

MASSACHUSETTS MOSQUITO CONTROL ANNUAL OPERATIONS REPORT



2011 Year of Report

Date of Report: January 2012

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

Address: 61 Endicott St, Bldg #34

City/Town: Norwood

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Report prepared by: *Dave Lawson*

If you have a mission statement, please include it here: Commission Mission Statement:
"The Norfolk County Mosquito Control Project Commission represents the interests of the member communities and their residents by providing oversight of Project activities. The Commissioners each live or work within a community serviced by the Project, were nominated by municipal authorities, and were evaluated and appointed to their posts by the State Reclamation and Mosquito Control Board. The Commission strives to ensure that the member communities receive services consistent with applicable laws and justified by tenets of public health, vector control, environmental safety and fiscal responsibility. The Commission invites input and questions from community officials and residents. The Project's website announces the Commission's monthly meetings and planned agendas, and hosts minutes from past meetings."

ORGANIZATION SETUP:

Please list your Commissioner's names:

Linda R. Shea, Chairman
Maureen P. MacEachern
Robin L. Chapell
Richard J. Pollack
Norman P. Jacques

Please list the Supt./Director's name: John J. Smith

Please list the Supt./Director's contact phone number: (781) 762-3681

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

Do you have a website? Yes

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

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

Full time: 11

Part time:

Seasonal: 1

Other: (please describe)

Please break these down into the following areas:

Administrative staff: 6

Field staff: 5

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

Public relations John Smith, David Lawson, Caroline Haviland, Nate Boonisar, Channsotha Suom, Elizabeth Donnell

Information technology Nathaniel Boonisar GIS, Channsotha Suom

Entomologist Channsotha Suom

Wetland Scientist Caroline Haviland

Biologist John J. Smith- Aquatic Biology/Aquatic Ecology/Limnology; Caroline Haviland-Environmental/Wetland Science concentration

Education Channsotha Suom

Laboratory Channsotha Suom, John Smith

Operations John Smith, David Lawson, Elizabeth Donnell, Caroline Haviland, Nate Boonisar, Channsotha Suom, Brian Moore, Robert O'Halloran, David Foley, William Haviland, John Tuana

Facilities David Lawson

Other (please list) Brian Moore, Bill Haviland, Robert O'Halloran, Dave Foley (retired), John Tuana, Anthony Caso (new employee)

For the year of this report, we maintained:

19 vehicles

3 modified wetland equipment (list type) Linkbelt 1600 quantum series excavator, modified (extended tracks) Kobelco SK60 excavator, non wetland - John deere 880 bulldozer

5 ULV sprayers (list type) Promist with Smartflow calibration systems and Datamaster data capture systems, 1 A-1 Mist Sprayer.

Larval control equipment (list type) hand applications only

Other (please be specific):

Comments: _____

How many cities & towns in your service area? 25

Please list: Avon, Bellingham, Braintree, Canton, Dedham, Dover, Foxborough, Franklin, Holbrook, Medfield, Medway, Millis, Milton, Needham, Norfolk, Norwood,

Plainville, Quincy, Randolph, Sharon, Stoughton, Walpole, Westwood, Weymouth, Wrentham

***Please attach a link to a map of your service area if possible.**
<http://www.massnrc.org/ncmcp/About%20Us/AboutUs.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: Targeted preemptive control measures are the most cost effective, efficient and environmentally friendly way to reduce mosquito populations. NCMCP applies insecticides to shallow water to control mosquitoes in their most vulnerable aquatic stages in an attempt to prevent the emergence of adult mosquitoes. A database of mosquito larval development sites are checked and treated as necessary by means of hand and/or aerial application.

Aerial Larval Control Program:

Spring and summer flooding following snow melt and/or heavy rainfall creates a potential each year for significant mosquito larval development in various wetlands across Norfolk County. The predominate species which develop in the spring are Ochlerotatus abserratus, Ochlerotatus excrucians and Ochlerotatus canadensis. In the summer the predominate species following river flooding are Ochlerotatus trivittatus, Aedes cinereus, Aedes vexans, Psorophora ferox and Ochlerotatus canadensis. All of these mosquito species are strong human biters and can create significant nuisance level populations during the late spring and summer months. During certain years some of the summer mosquito species, such as Aedes vexans, may be involved in the transmission of Eastern Equine Encephalitis (EEE) from birds to humans. In an effort to proactively control these aggressive human biting species, and in an environmentally responsible manner, the Norfolk County Mosquito Control Project conducts aerial larval control operations using a product called Bacillus thuringiensis israelensis (Bti). In small wetlands and in larval development sites proximate to homes where aircraft applications are not suitable hand applications using the same product at the same rates are utilized.

Rain Basin/Detention Basin Treatments:

NCMCP makes applications of an insecticide to catch basins, storm water structures, etc. to control primarily Culex mosquitoes in their aquatic stages. Culex species have been identified as likely vectors of WNV.

Please give the time frame for this program: mid-April through early September (Rain Basins early June through mid-August).

Describe the areas that this program is used: The typical wetlands treated during the spring are described as large (greater than five acres) Wooded Swamp Deciduous/Coniferous/Mixed, Shrub Swamp, Shallow Marsh/Meadow/Fen wetlands as delineated on the DEP Wetland GIS Shape File. Summer applications are more typically conducted over river floodplain areas especially within wetlands adjacent to the Neponset and Charles Rivers. Maps of aerially targetted wetlands are available on the Project's website.

Rain Basin treatments typically occur in high density population areas around centers of towns and heavy residential/commercial areas.

Do you use:

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

Comments: _____

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

Wetlands: Bti (*Bacillus thuringiensis israelensis*) granular (Vectobac G) EPA Reg. # 275-50

Catch basins: Methoprene (Altosid 30 Day briquet) - EPA Reg # 2724-375, Fourstar 90 day briquets - EPA Reg. # 83362-3

Containers: Methoprene (Altosid 30 Day briquet) - EPA Reg. # 2724-375

Other (please list):

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

Wetlands: Vectobac G 5-20Lbs/acre depending on situation

Catch basins: One Methoprene (altosid) - briquet/basin, stormwater detention basins - one briquet/ 100 sq. ft, one WSP pouch/basin or 1/50 sq. ft.

Containers: One Methoprene (altosid) briquet/ 100 sq. ft.

Other:

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

- Larval dip counts – please list trigger for application: presence of larvae and instar stage during pretreatment dips
- Historical records
- Best professional judgment

Comments: Historical records and best judgement are reserved for some wetlands in aerial applications. Ground applications always require presence of larvae for treatment.

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

<http://www.massnrc.org/ncmcp/Strategies/AerialMaps.htm>

ADULT MOSQUITO CONTROL:

Do you have an adult mosquito suppression program? Yes

If yes, please describe the purpose of this program: When larviciding is not a viable option (example: *Coquillettidia perturbans*) and/or when adult mosquito populations reach levels which are either bothersome to residents and/or a public health concern is realized, targeted adulticiding applications are used. NCMCP makes decisions to use adulticides based on evaluations of the risks of EEE or WNV transmission to humans in collaboration with MDPH or based on evaluations of the nuisance level that residents

report to NCMCP. NCMCP also bases decisions to adulticide on mosquito surveillance (trap counts), field crew observations and after careful analysis of predicted local weather conditions.

Please give the time frame for this program: Late May through mid-September depending on weather conditions.

Describe the areas that this program is used: ULV applications typically take place in residential areas. Maps of the areas to be treated are loaded on the Projects website by 3:30 P.M. the day before the scheduled application. Barrier Applications are conducted on school property and other municipal parks and property.

Do you use:

- Truck applications**
- Portable applications**
- Aerial applications**
- Other (please list): Barrier Applications**

Comments: _____

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

- 1). Anvil 10+10 ULV (Sumithrin) EPA Reg. #1021-1688-8329
- 2). Duet Duet action insecticide EPA Reg #1021-1795-8329
- 3). Mavrik Perimeter (Tau-fluvlinate) EPA Reg # 2724-478
- 4).
- 5).
- 6).

Please list your application rates for each product:

- 1). Anvil - 0.62 fluid ounces/acre ULV
- 2). Duet - 0.62 fluid ounces/acre ULV
- 3). Mavrik - Perimeter Treatments: 0.5 oz/gallon: Use sufficient product to cover the foliage.
- 4).
- 5).
- 6).

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

ULV maximum - once per week, except in emergency situations. On average for most residential areas @ 1 to 4 applications per month. Barrier applications - once every 2-3 weeks as needed.

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.**

<http://www.massnrc.org/ncmcp/ULVSchedule/ULVSchedule.htm>

(Note: these maps are only available on the website during the months when these applications are taking place)

SOURCE REDUCTION

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

If yes, please describe your program: NCMCP advises residents/Boards of Health in person or via phone or internet to empty any containers that may hold water on their property. When performing site visits, personnel will overturn containers or tires that hold water and may contain mosquito larvae.

What time frame during the year is this method employed? June through September

Comments: The NCMCP also considers our Ditch Maintenance, FWWM and OMWM programs valuable methods of source reduction.

DITCH MAINTENANCE

Do you have a ditch maintenance program? Yes

Please check all that apply:

- Inland/freshwater
- Saltmarsh

If yes, please describe: The NCMCP Water Management Program consists of clearing previously existing and maintained drainage ditches and streams of silt, vegetation and debris in order to restore proper water flow, eliminate standing water, thus reducing mosquito larval development. Crews clear these systems through the use of several different types of hand tools, as well as through the use of our two specialized wide-tracked, low ground pressure excavators. This work is performed pursuant to chapter

252 of the MA General Laws in compliance with established federal (USACE) guidelines and oversight. The NCMCP is interested in working with the regulatory community, within the legal thresholds, in order to implement source reduction practices that specifically improve our wetland resources or habitats for fish and wildlife. Water Management work can reduce the amount of insecticide the Project has to use in order to reduce the nuisance/vector population of mosquitoes in the surrounding area. We refer to this type of work as source reduction work and consider such work to be an important part of an Integrated Pest Management (IPM) strategy. Data collection and surveillance measures are important elements of any mosquito IPM strategy. Data collected during insecticide applications is used to aid in the determination of future Water Management Project sites.

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 165,400 ft checked, 99,250 cleaned
Mechanized cleaning 1,150
Other (please list): 108 Culverts cleaned

Comments: _____

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

Hand cleaning 0
Mechanized cleaning 0
Other (please list):

What time frame during the year is this method employed? All year, but primarily Fall and Winter

Comments: _____

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

MONITORING (Measures of Efficacy)

Please describe monitoring efforts for each of the following:

Aerial Larvicide – wetlands: pre/post monitoring of larval populations including determination of developmental stage (instar & pupae)
Larvicide – catch basins: Beginning of season monitoring to determine the presence of larvae in basins.
Larvicide-hand/small area pre/post monitoring of larval populations including determination of developmental stage (instar & pupae)
Ground ULV Adulticide: pre/post CDC Light trap sampling, complaint call data, field observations
Source Reduction: pre/post monitoring of larval populations including determination of developmental stage (instar & pupae)
Open Marsh Water Management: pre/post monitoring of larval populations including determination of developmental stage (instar & pupae)
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): **Website showing aerial larval control efficacy protocol and data:**

<http://www.massnrc.org/ncmcp/Research/Research.htm>
http://www.massnrc.org/ncmcp/Research/BottleAssay/2010_bottle_assay.htm
http://www.massnrc.org/ncmcp/Research/Aerial/2010_Aerial.htm
http://www.massnrc.org/ncmcp/Research/Aerial/2009_Aerial.htm
<http://www.massnrc.org/ncmcp/Research/2008%20Bti/2008%20Bti%20Test.htm>

Website showing adult control efficacy protocol and data:

<http://www.massnrc.org/ncmcp/NCMCP%20ULV%20efficacy%20study.pdf>

OPEN MARSH WATER MANAGEMENT

Do you have an OMWM program? Yes

If yes, please describe: Open Marsh Water Management is a technique which provides a greater access to the salt marsh for small fish which eat mosquito larvae developing on the marsh. This greatly reduces the need for mosquito adulticiding in the immediate neighborhood. The work also reverses some of the changes that were done to the marsh when it was originally ditched. OMWM also prevents the encroachment of invasive plants and provides better habitat for waterfowl and other birds.

Please give an estimate of total square feet or acreage: none this year

What time frame during the year is this method employed? Late Fall - winter

Comments: _____

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

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: 50+ gravid, @25 CDC Light traps, more deployed in virus positive locations

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 type="checkbox"/> ABC light traps w/CO ₂ | <input type="checkbox"/> Canopy |
| <input type="checkbox"/> NJ light traps | <input type="checkbox"/> Canopy |
| <input type="checkbox"/> NJ light traps w/CO ₂ | <input type="checkbox"/> Canopy |

Other (please describe):

Please describe the purpose of this program: CDC Light Traps: CDC Light Traps with CO₂ are used to determine the presence of adult mosquitoes and their density. CDC Light Traps with CO₂ are also used to monitor for EEE and West Nile Virus. Collections of mosquitoes (pools) are submitted weekly to the Massachusetts Arbovirus Surveillance

Laboratory (MDPH) for the purpose of monitoring the presence of West Nile Virus and EEE in local mosquito populations.

Gravid Traps: These traps are used by NCMCP to collect primarily *Culex pipiens* and *restuans* mosquitoes for submission to the Massachusetts Arbovirus Surveillance Laboratory (MDPH) for West Nile Virus analysis. Gravid mosquitoes which are attracted to these traps are important to sample because they may have recently fed on a bird. The bird biting species are usually the first to pick up the virus since they feed primarily on birds where West Nile virus originates.

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

If yes, please describe how you chose these long-term sites. CDC Light Traps: CDC Light traps with CO₂ are placed for maximum collection of species of interest both for monitoring of human biting populations as well as for collection of species important in the transmission of EEE and WNV.

Gravid Traps: Gravid Traps are placed at locations for maximum collection of *Culex pipiens* and *restuans*. Traps are located in all 25 communities usually in the highest urbanized areas for maximum collections.

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 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 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 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? ~22

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: 2009: Cow Case - Walpole 10/7/2009 EEEV
2005: Horse Case - Wrentham 8/24/2005 EEEV

2004: Horse Case - Walpole 8/25/2004 EEEV
Human Cases - under 18, 8/23/2004 EEEV
- under 18, 10/24/2004 EEEV

Data from MDPH website.

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

WNV: All towns "low" risk except Millis, Medway, Franklin and Bellingham - "remote" risk.

EEE: All towns "remote" risk.

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

WNV: All towns "low "risk except Quincy, Milton, Dedham, Needham raised to "moderate" risk.

EEE: All towns "remote" risk except Stoughton and Holbrook raised to "low " risk and Sharon raised to "moderate" risk.

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

Comments: _____

***Please attach a link to maps of surveillance areas if possible.
<http://www.massnrc.org/ncmcp/TrapMap/TrapMap.htm>**

EDUCATION, OUTREACH & PUBLIC RELATIONS

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

If yes, please describe: NCMCP maintains a very informative website which is updated daily during the season. The Quick Links on the Home Page contains fact sheets concerning West Nile virus and EEE virus. The Home Page also contains Notices and News regarding treatment beginning and end dates and ways to protect yourself from mosquito bites around the home. The various tabs on the Navigation bar lead to our operations, maps of treatment and problem areas, control strategies, products used, and frequently asked questions (FAQs) pages. Information to regulatory agencies such as the Federal Environmental Protection Agency and the State Pesticide Bureau are also available. The website also contains links to the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention (CDC) where residents can find up to date information on arbovirus activity in the county, the state as well as country wide. There is information available on how a resident may go about excluding their property from the Program as well as links which help guide daycare managers and school administrators through the some what complex compliance requirements of the Childrens and Family Protection Act. The website also provides rapid access to the Projects administrative personnel through the email link at the bottom of the websites main page.

Please check off all that apply:

- School based program
- Website
- PR brochures/handouts
- Community events
- Science fairs
- Meeting presentations
- Other (please describe):

Please give an estimate of attendance/participants in this program: varies

Please list some events you participated in for the year of this report: annual town meeting, board of health meeting, city councilor community meetings, meeting with mayor, Health Fairs, Northeast Mosquito Control Association (NMCA) Conference.

What time frame during the year is this method employed? whenever needed

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

If yes, please elaborate on your research projects: 1) Oviposition Activity of Mosquitoes in Massachusetts, presentation at the Northeast Mosquito Control Association Conference. Chan Suom (NCMCP), Frank Cornine III (Central Mass. Mosquito Control Project)

2) Aerial Trial to Determine Effective Swath Width during Aerial Applications of Vectobac G, David Lawson, Chan Suom, presentation at the Northeast Mosquito Control Association Conference.

3) Host-Seeking Activity of Mosquitoes in Massachusetts
Frank Cornine III, Central Mass. Mosquito Control Project - presented at NMCA meeting Dec. 2009 - Chan Suom (NCMCP) collaborated with this research.

4) Utilization of Resting Boxes in Southeastern MA – Part 2
Priscilla Matton, Bristol County Mosquito Control, and Nate Boonisar, Norfolk County Mosquito Control Project - presented at NMCA meeting Dec. 2009

5) Bottle Assays: Sumithrin exposure at 1-, 2.5-, 5-, and 10-ml on *Culex pipiens/restuans* mosquitoes (Summer 2010)
http://www.massnrc.org/ncmcp/Research/BottleAssay/2010_bottle_assay.htm

6) 2010 Aerial Larvicide Efficacy
http://www.massnrc.org/ncmcp/Research/Aerial/2010_Aerial.htm

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

If yes, please elaborate on your collaborations this past year:
Ongoing collaboration with town of Dedham BOH in assistance with problem beaver issues. Other towns as well.

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

Summer, 2011 Northeast Weather Recap, Nathaniel Boonisar.

Does your staff participate in educational opportunities? Yes

If yes, please list the training and education your staff received this year: Northeastern Mosquito Control Association Annual Meeting, Plymouth, Ma., December 2011. AMCA Webinars, EPA NPDES Webinar, Northeastern Mosquito Control Association Field

Equipment & Safety Training October 2010, various DPH conference calls and meetings relative to adult surveillance, aerial adulticide operation, processing of mosquito pools and analysis of virus isolations.

Please list the certifications and degrees held by your staff: Director - Bachelor of Science (Entomology), Asst. Director - Masters (Geology), Water Management Program Coordinator - Bachelor of Science (Biology), GIS Coordinator - Masters (Geological Oceanography), Entomologist - Masters (Entomology)

All field staff hold pesticide licenses and certifications in the Mosquito and Biting Fly Category

Comments: Dave Lawson and Caroline Haviland are board members of the Northeast Mosquito Control Association.

BIOLOGICAL CONTROL EFFORTS

Do you have a biological control program? Yes

If yes, please describe: OMWM...see comments in section above.

Is this program the introduction of mosquito predators or the enhancement of habitat for native predators? yes - enhancement of habitat of 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? September - March

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: NCMCP uses GIS in various aspects of our work.

Spring aerial larvicide: GIS is a valuable tool in this aspect of our program. Using the Mass. DEP wetland layers, NCMCP identifies potential larval development areas that NCMCP personnel also dip on a yearly basis. The dip data is added to each wetland and NCMCP now has stored up to 10 years of mosquito larval development data on these wetlands. The wetland files can be directly converted and loaded into aircraft, and treatment information (flight paths) from the aircraft can be converted back into GIS shapefile format and stored. Coupled with this, NCMCP uses the wetland layers to determine ground larvicide sites and store larval dip data for these as well.

ULV Applications: NCMCP regularly geocode (plots) request calls based on address and NCMCP plans ULV treatments around these calls. Paper maps are given to the field crew to aid in their work. As of 2007, NCMCP acquired GPS tracking devices for the ULV spray trucks. The GPS data can be converted into GIS format and stored on our system to monitor areas that were treated, as well as time of treatment, and treatment rate. NCMCP is currently working on a project to plot request calls back as far as possible (at least 10 years). This will help NCMCP locate consistent problem areas and provide guidance as to what areas need more attention on a yearly basis.

Water Management: Using the layers provided by MassGIS, NCMCP can locate wetlands, streams, environmentally sensitive habitats, water supply areas, etc. and plan field work around these sites. Additionally, remote sensing using the aerial photographs (both real color and infrared) provides useful information on the areas. Some NCMCP towns also have their own GIS layers including pipes, culverts, ditches, and 2-foot contour lines which provide an extremely detailed depiction of an area. NCMCP also has site specific GIS shapefiles that document all water management/hand cleans which includes all relevant information regarding work performed at each site

Please describe your current GIS abilities: Advanced

Give details if possible on your GIS abilities: We use ArcMap 9.3. NCMCP's Surveillance Tech continues to learn new capabilities of this software. His abilities

include general map-making, geocoding, buffering, calculating acreages and lengths, analization using different colors/sizes of features based on associated data, and the ability to create professional looking maps. ArcMap has a wide variety of uses, and as NCMCP attempt new analization techinques, the Surveillance Tech learns more of the abilities of ArcMap. He has also helped other MDC's with various aspects of their GIS program, such as training and support in their use of ArcView.

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.

A01-State Employee Compensation	626,158.40
B02-In State Travel	2,068.68
B06-Trng,membershp, license	240.27
B08-Clothing Allowance	336.60
B10-Exigent Job Related Expenses	586.96
B1B-Out of State Travel	670.19
D09-Fringe Benefits 1	46,494.10
D12 14 19 - Insurance	8,842.78
D15-Workers Compensation Chargeback	12.66
D20-Pension Insurance Expenditures	97,924.24
E01- Office & Admin Supplies	1,913.13
E06 - Postage	176.50
E13 - Advertising Expenses	389.50
E15 - Bottled Water	192.54
E19 - Fees, Licenses, Permits	1,250.00
EE2-Confer Trng, Registration fees	2,240.00
F05 - Laboratory Supplies	2,738.67
F09 - Clothing & Footwear	2,057.18
F11 - Laundry & Cleaning Supplies	417.61
F24 - Motor Vehicle Maintenance	3,992.92
G01 - Space Rental	75,000.00
G03 - Electricity	9,225.47
G05 - Fuel for Fleet	12,468.40
J62 - Contracted Advisory Boards	5,400.00
JJ2 Auxiliary Service	159.00
K06-Printing, Photocopying, & Micrograph	46.95
K11- Heavy equipment	5,554.91
L26-Photocopy Rental	1,247.67
L44 - Motorized Vehicle Equipment Maint	13,934.61
L51 - Heavy Equipment Maintenance	6,341.96
L63 - Programmatic Equip Maint & Repair	559.78

N50 - Non-Major Facility Maint Repair	622.00
N52 - Facility Maintenance & Repair	10,033.65
N64 - Garden Expenses, Tools & Supl.	294,345.05
N71 - Exterminators	93,980.80
N73 - Non Hazardous Wast Removal	1,142.15
U01 - Telecommunications Services	2,466.27
U02 - Telecommunications Services	4,951.20
U07 - Information Technology Equip.	3,094.31

OVERALL TOTAL 1,439,277.11

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

Comments:

AVON	17,365
BELLINGHAM	54,140
BRAINTREE	73,069
CANTON	78,918
DEDHAM	54,746
DOVER	49,394
FOXBOROUGH	59,464
FRANKLIN	96,968
HOLBROOK	26,085
MEDFIELD	49,061
MEDWAY	37,421
MILLIS	29,020
MILTON	65,229
NEEDHAM	75,277
NORFOLK	37,378
NORWOOD	56,414
PLAINVILLE	29,137
QUINCY	112,084
RANDOLPH	49,892
SHARON	65,960
STOUGHTON	68,573
WALPOLE	79,035
WESTWOOD	53,771
WEYMOUTH	89,070
WRENTHAM	50,989
All Municipal	1,458,460

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: Anvil 10+10 ULV
EPA Reg. #: 1021-1688-8329
Application method: ULV truck mounted
Targeted life stage: Adult
Total amount of concentrate applied: 160.74
Comments: _____

Product Name: Duet Duel-action insecticide
EPA Reg. #: 1021-1795-8329
Application method: ULV truck mounted
Targeted life stage: Adult
Total amount of concentrate applied: 572.70
Comments: _____

Product Name: Vectobac G
EPA Reg. #: 730 49-10
Application method: Helicopter, hand
Targeted life stage: Larvae
Total amount of concentrate applied: 56,742
Comments: 54,640lbs aerial, 2,102 lbs hand

Product Name: Altosid 30 Day briquet
EPA Reg. #: 2724-375
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 14.1 lbs
Comments: 1,185 briquets

Product Name: Fourstar Briquets
EPA Reg. #: 83362-3
Application method: hand
Targeted life stage: Larvae
Total amount of concentrate applied: 88.6 lbs.
Comments: 20,617 briquets

Product Name: Mavrik Perimeter
EPA Reg. #: 2724-478
Application method: Mist sprayer
Targeted life stage: Adult
Total amount of concentrate applied: 4.5 oz

Comments: barrier applications

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: _____

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?
Yes

If yes, please explain, and attach maps or a web link if possible. Our largest exclusion zone is the Massachusetts Audubon Society's Moose Hill Wildlife Sanctuary in Sharon. NCMCP does not adulticide or larvicide this area. Moose Hill accounts for approximately 11% of the Town of Sharon's wetland area. The towns of Canton and Norfolk have smaller, but still significant Audubon properties that are excluded. All resident exclusion zones are located via parcel maps, geocoding, or field checks, and a 300-foot buffer zone is placed around them. These areas are shown on the field crew ULV maps, along with the written address of the exclusion.

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 NCMCP personell frequently inspect and treat conctructed wetlands (retention, detention ponds, remediation site, etc.). Local Boards of Health have been asking at a much higher frequecy that NCMCP inspect and treat abandoned

and/or non-maintained swimming pools. NCMCP has been contacted often by town boards for input on subdivision plans. At this point there is no legal mechanism to prevent the creation of mosquito larval development sites when developing a site.

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: NCMCP is in direct communication with local DPW departments with regard to clogged culverts and stormwater systems. NCMCP coordinates with many local DPWs annually to clean catch basins and drainage pipes of sand and debris that may eventually discharge into adjacent wetlands. Some town departments have assisted NCMCP by bearing the burden of disposing of sands and sediments NCMCP removes from drainage ditches and/or streams. NCMCP has communicated with several Conservation Agents and Planning Board members in recent years relative to review, advise and discussion of stormwater issues. This relationship continues to expand.

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

If yes, please elaborate: see above

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: Dave Lawson and Caroline Haviland are board members of the Northeast Mosquito Control Association.

CHILDREN AND FAMILIES PROTECTION ACT

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

If yes, please explain: Throughout the Projects service area, NCMCP has approximately 225 schools and 250+ day cares that must comply with this law. Each school/day care has been located either through parcel maps, when available, or through geocoding, combined with aerial photography or pictometry. A 300-foot buffer zone has been created around the school/day care property as well as any adjacent athletic fields. On the ULV maps that the field crews use to navigate by, the streets within the buffer zone are shown in red (as an exclusion) along with a symbol indicating the location of the school/day care. The GIS layers are set in such a manner that a school or day care exclusion can be easily removed or replaced depending on compliance. The school

and day care data are checked on a yearly basis for changes in status, and buffer zones updated accordingly. The exclusion zones are clearly marked on the ULV route maps that are posted on the Projects website in an effort to keep the public informed of the exclusionary status of these areas. It has become abundantly clear to The NCMCP, that local school systems consider the requirements of this act (in relation to mosquito control activities) overly burdensome.

If you have data on compliance with this Act and your program, please list here: NCMCP has a GIS layer showing points as locations of schools/day cares, and has a separate GIS layer depicting red lines as the exclusion zones around such properties.

If you had difficulties with implementation of your program due to this law, please elaborate here: NCMCP generally does not have widespread problems complying with this law, however there are, from time to time, issues which arise. In high density communities such as Quincy and Weymouth, the most common complaint received is from residents adjacent to schools, who question why they are in an exclusion zone. After explaining the law, the residents often express their frustration as to why their area can not be treated with the early morning ULV applications especially when the school is vacant at these hours. NCMCP is concerned that many residents may consider treating their own properties. NCMCP is concerned that this could cause an increase in non-professional applications of pesticides on properties within these exclusion zones. The situation is further exacerbated when mosquito borne viruses are identified in the area. Non-compliant schools, and some times students parents, will call NCMCP to have the school property treated. Very often after explaining the law, the school (and the concerned parents) express frustration as to the burdensome process that must be completed in order to bring the school/day care into compliance. NCMCP has had some instances where a public school is in compliance with the law, but an adjacent private school or day care was not, and the overlapping buffer zone prevented NCMCP from treating the public school. Satisfying the requirements of the Act becomes particularly frustrating in September when children are participating in outdoor sporting activities during peak viral activity. Parents and administrators typically want the athletic fields treated quickly without the extra burden of the Act. Again, this creates frustration for school officials, parents, and mosquito control projects.

Comments:

GENERAL COMMENTS

Please list any comments not covered in this report: [View a link to our NPDES Notice of Intent.](#)

<http://cfpub.epa.gov/npdes/pesticides/pesticidenoisearch.cfm>

Norfolk County Mosquito Control Project Pesticide Discharge Management Plan

Norfolk County Mosquito Control Project (NCMCP)

61 Endicott Street

Building #34

Norwood, MA 02062

(Office) 781-762-3681

(Facsimile) 781-769-6436

(Email) ncmcp@verizon.net

(Web site) <http://www.massnrc.org/ncmcp/>

A. Pesticide Discharge Management Team. All persons may be contacted at: Norfolk County Mosquito Control Project, 61 Endicott Street, Building #34, Norwood, MA 02062, (Office) 781-762-3681, (Facsimile) 781-769-6436.

1. Person(s) responsible for managing pests in relation to the pest management area.

a. David Lawson – Assistant Director

2. Person(s) responsible for developing and revising the PDMP.

a. David Lawson - Assistant Director

3. Person(s) responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements.

a. David Lawson – Assistant Director

4. Person(s) responsible for pesticide applications (mix, load, apply).

a. David Lawson - Assistant Director

b. Caroline Haviland – Wetlands Management Project Coordinator

c. Nate Boonisar – GIS Analyst, Surveillance Technician

d. Channsotha Suom - Entomologist

e. Brian Moore - Field Technician Supervisor

f. William Haviland – Tractor Operator

g. Robert O’Halloran – Tractor Operator

h. John Tuana - Field Technician

i. Anthony Caso – Field Technician

B. Pest Management Area Description

1. Pest Problem Area Description: Norfolk County Mosquito Control Project conducts mosquito control operations in 25 of the communities in Norfolk County, Massachusetts. These towns are Avon, Bellingham, Braintree, Canton, Dedham, Dover, Foxborough, Franklin, Holbrook, Medfield, Medway, Millis, Milton, Needham, Norfolk, Norwood, Plainville, Quincy, Randolph, Sharon, Stoughton, Walpole, Westwood,

Weymouth and Wrentham. The coverage area is approximately 400 square miles. Pest problem areas can best be separated into 2 broad types within our service area that can be further divided into more specific groups based on habitat type.

i. Natural Environments

1. Coastal and intercoastal islands, hummocks, and high marsh areas are dispersed throughout our coastal region. These areas are affected by high river stages in the spring due to rains, and tidal influences. Ochlerotatus taeniorhynchus and Ochlerotatus sollicitans (salt marsh species) are major problems in these areas, although Culex salinarius can be common at such sites. Ochlerotatus cantator is also a major problem in the brackish areas associated with these coastal habitats.

2. Woodland wetlands (Red Maple), bogs, shrub swamps, ferns, wooded coniferous/deciduous swamps, and depressions caused by uprooted trees. transient pools (vernal pools), and shallow grass hummock marshes are the primary spring relood mosquito habitat. Summer relood species occur mainly in flooded areas associated with river flood plains (Charles and Neponset Rivers and their tributaries) but other flooded wetlands and road side ditches can produce summer relood species. Many of these sites only contain water during the wet seasons of the year, or when heavy or prolonged precipitation occur and serve as excellent habitat for development of most species of mosquitoes found in Norfolk County.

3. Other natural environments include tree holes, and tree cavities.

ii. Man-made Environments

1. Shallow roadside ditches that hold water do contribute to mosquito populations at times. Such sites often remain dry throughout much of the year or because of temperature, oxygen content, or other factors do not support fish life. Mosquito species encountered in such sites include Aedes vexans, Culex salinarius, Culex restuans, and many species of Ochlerotatus.

2. Fallow cranberry bogs serve as habitat for a number of species of mosquitoes in our area. These shallow acidic wetlands can produce large numbers of mosquitoes.

3. Storm drains and catch basins are found throughout areas of the county, and provide an appropriate organic environment for Culex pipiens/restuans, one of the primary West Nile Virus (WNV) vectors.

4. Containers come in all sorts of shapes and sizes. These may be represented by something as small as a bottle cap to something as large as a discarded or unkempt boat. Containers serve as the primary developmental site for Culex pipiens which is frequently associated with mosquito problems in our more urban and suburban areas of the county.

5. Other man-made sites include retention and detention ponds especially in residential or in new housing developments.

2. Pest Problem Description

a. Pest Problem Area Description: Norfolk County Mosquito Control Project conducts mosquito control operations in 25 of the communities in Norfolk County, Massachusetts. These towns are Avon, Bellingham, Braintree, Canton, Dedham, Dover, Foxborough, Franklin, Holbrook, Medfield, Medway, Millis, Milton, Needham, Norfolk, Norwood, Plainville, Quincy, Randolph, Sharon, Stoughton, Walpole, Westwood, Weymouth and Wrentham. The coverage area is approximately 400 square miles.

There has been 51 species identified in the Commonwealth of Massachusetts of which Norfolk County concentrates on approximately 20 which are either human biting species or species involved in vectoring mosquito born diseases. The Following is a list of the species of most concern in Norfolk County and which we focus the majority of our control activities on:

i. Aedes vexans is a common woodland mosquito that has the potential to fly up to 5 miles or more. It is generally encountered in the late spring and summer following heavy rain events. This is a floodwater species and emerges in very large numbers especially from flood plain habitats. This species has been implicated as a vector of eastern equine encephalitis virus (EEEV).

ii. Coquillettidia perturbans is a fairly large and aggressive mammal biting mosquito that is often associated with permanent water habitats containing abundant emergent vegetation such as cattails, Typha spp. The larvae of this species attach their breath apparatus (siphon) to the roots of this emergent vegetation and therefore do not make themselves available for control using conventional larvicide agents. It is generally considered a bridge vector of EEEV to mammals, but has also tested positive for WNV in the United States. It commonly takes blood meals from both bird and mammal species (including humans).

iii. Culex pipiens, the Northern House mosquito, is believed to be our region's primary WNV vector. It prefers somewhat stagnant or polluted water conditions as larval habitat, and can be a common species in storm drain systems, especially in drainage lines equipped with sumps in the catch basins that tend to hold water on a permanent basis. This species has also been collect in abundance from a variety of artificial containers

iv. Culex restuans is an early season mosquito peaking in July. Larval habitats for this species typically include a variety of semi-permanent waterways, including roadside ditches and woodland pools. It has been reported to carry both EEEV and WNV, and may be an important vector in the initial amplification of these viruses in bird populations as birds appear to be its primary blood hosts.

v. Culex salinarius is a common coastal Culex mosquito species in Norfolk County. Adults are readily attracted to light traps, and larvae are found in both freshwater and somewhat saline (brackish) environments. This species has been recorded to carry EEEV and WNV. It appears to be an opportunistic feeder of birds, mammals, and even reptiles.

vi. Culiseta melanura and Culiseta morsitans are swamp mosquitoes that occur in Atlantic White Cedar Swamps – hardwood floodplains and other aquatic habitats characterized by low pH. The larvae often are found within subterranean pockets (crypts) that are difficult to treat with conventional larvicide agents. Culiseta melanura almost exclusively obtains its blood meals from birds, and is the primary bird to bird vector in the amplification of EEEV in Norfolk County. It has also been found to carry WNV.

vii. Ochlerotatus sollicitans, the brown salt-marsh mosquito is a fairly large mosquito that can be a serious pest along the immediate coast. It is active during both daytime and nighttime periods, and can fly great distances from its original source. It has been reported to carry EEEV in the northeastern US.

viii. Ochlerotatus taeniorhynchus, the black salt-marsh mosquito is a nuisance mosquito species that is capable of producing tremendous numbers of adults after coastal flooding events caused by rains or extreme high tides. Fortunately Norfolk County is on the northern edge of this very aggressive species (North American) range so we only observe infrequent localized populations.

ix. Ochlerotatus cantator, the brown salt-marsh mosquito is a fairly large mosquito that can be a serious pest along the immediate coast. It is active during both daytime and nighttime periods, and can fly great distances from its original source.

x. Ochlerotatus canadensis and Ochlerotatus excrucians are freshwater mosquitoes. Species which develop in temporary or semi-permanent woodland pools and wetlands. The females will bite in the woods any time of day, but are most active in the evening. They are aggressive and long-lived. These are two of the three species we target with our spring aerial Bti applications.

xi. Aedes cinereus is a freshwater mosquito species. Larvae develop in temporary or semi-permanent woodland pools, sedge tussocks and margins of boggy areas. The females will bite in the woods and can emerge in large numbers.

xii. Anopheles barberi is mainly a tree hole and artificial container species. This species can create localized problems but is not normally a county wide nuisance.

xiii. Anopheles punctipennis develops in semi-permanent ponds, rock pools and margins of slow moving rivers. As with the above species this species causes local nuisance biting levels.

xiv. Anopheles quadrimaculatus develops in marshes, ponds, and margins of slow moving rivers. This is the most widely distributed of the Anopheles species in Norfolk County and can produce levels high enough to cause sporadic human nuisance.

xv. Ochlerotatus abserratus is one of three species we target with our aerial Bti applications. This species develop in sphagnum bogs and similar freshwater wetland habitats. This species is one of the first spring relood species on the wing each season.

xvi. Ochlerotatus japonicus develops in natural and (especially) artificial containers. The adults are strong (localized) daytime biters.

xvii. Ochlerotatus triseriatus is often called the "tree hole mosquito" because it primarily develops in tree holes which hold water but is also found in artificial containers. This species can also produce localized nuisance level populations.

xviii. Psorophora ferox develops in woodland pools and shaded floodplains. The adults of this species can cause sever nuisance due to the large number which emerge following heavy summer rainfall.

Note: There are several minor mosquito species which only rarely produce populations high enough to warrant control efforts. Much of the descriptions in this section were referenced from "Identification Guide to the Mosquitoes of Connecticut" by Theodore G. Andreadis, Michael C. Thomas & John J. Shepard with Illustrations by Gale Ridge. This guide was produce by The Connecticut Agricultural Experiment Station, 123 Huntington Street, New Haven, CT 06511.

3. Action Threshold

a. Recently the following thresholds were established to trigger larviciding missions within our service area (Reference Generic Environmental Impact Report for Massachusetts Mosquito Control – hereafter GEIR):

i. Treatments of larval mosquito habitat may be conducted in areas that are found to contain an average of at least 1 larva per ten (10) dip (using a standard 12 oz. dipper). Actual treatments or the use of larvicides will be based on local demographics, mosquito species present, and other historic and current conditions.

ii. The storm water system may be treated in selected areas of the county where vector species have been found or where there is a history of arbovirus activity.

iii. Adult (Ultra Low volume aerosol) applications based on regional light trap data, telephone/email complaint calls and (in some cases) landing count levels. The standard threshold used at Norfolk County Mosquito Control Project is the GEIR recommendation of more than 5 human-biting mosquitoes per light trap per night. If landing counts are used the threshold is more than one mosquito landing per minute. For public complaints Norfolk County Mosquito Control Project uses a threshold of one or more per mile radius. Normally the decision making process for ULV applications is based on a review of a compilation of all of the above surveillance data systems.

4. General Location - All known mosquito breeding sites within the Norfolk County Mosquito Control Project service area are databased and mapped. The Project maintains GIS maps of all aerial and ground larval mosquito development sites. The GIS maps also are linked to a larval collection database which can be directly accessed from the GIS map for detailed larval collection data and management activities. All Ultra Low volume aerosol applications are GPS tracked and recorded using a Datamaster software/hardware system which is integrated with the spray system. All data collected during these applications is stored and converted to GIS for further review and analysis.

5. Water Quality Standards - No Waterway or wetland in the Norfolk County Mosquito Control Project service area is impaired with any pesticides used by the Norfolk County Mosquito Control Project.

C. Control Measure Description.

1. Description of the control measures to demonstrate how the operators specifically plan to meet the applicable technology-based or water quality-based effluent limitations.

a. Prevention, mechanical/physical methods, and cultural methods are by proactive by definition. These methods can be as basic as simply emptying water from containers to hand cleaning (or excavator) restoration of ditches to complex projects such as repairing drainage infrastructure which often requires the involvement of other county departments, such as Public Works. Educational outreach at local schools and public events allow Norfolk County Mosquito Control Project staff the opportunity to suggest ways that residents can assist in the prevention of mosquito problems by removing containers and articles from their yards that provide larval habitat, and to be mindful that stagnant birdbaths and clogged rain gutters can serve as mosquito sanctuaries when not properly maintained.

The Norfolk County Mosquito Control Project has been utilizing a salt marsh mosquito control technique called Open Marsh Water Management (OMWM) since 1999. The only current Norfolk County Mosquito Control Project municipalities with salt marsh and therefore eligible for this type of work are Braintree, Milton, Quincy, and Weymouth. Open Marsh Water Management is a technique, which provides a greater access to the salt marsh for small fish, which eat mosquito larvae breeding on the marsh. This greatly

reduces the need for mosquito control pesticide treatments in the immediate neighborhood. This work also reverses some of the changes that were done to the marsh when it was originally ditched for mosquitoes. OMWM can also prevent the encroachment of invasive plants and provide better habitat for waterfowl and other birds. Open Marsh Water Management is designed to utilize some of the old ditches, fill in certain other ditches and create small ponds that will provide habitat for the fish and birds.

b. Biological control agents are used at the Norfolk County Mosquito Control Project. Formulations containing the active ingredients Bacillus sphaericus (Bs) and/or Bacillus thuringiensis israelensis (Bti) are used to treat flood water and salt-marsh mosquito larval sites. These products are also used in alternating years to treat catch basin/storm drains, to prevent resistance in the primary WNV vector species. The Norfolk County Mosquito Control Project also uses Altosid (a juvenal insect growth hormone with the active ingredient methoprene) in rain basin treatments in an alternating method with the other biological products mentioned above. The wetlands to be treated via aerial applications are identified on the Projects web site prior to these applications. All other larval control applications are done by hand using a granular formulation and thus calibration is not required other than to follow proper label rates.

c. Although these larval control products are very effective there is frequently a need to conduct follow up adult control applications. Certain species of mosquitoes can not be effectively treated as larvae (Coquillettidia perturbans & Culiseta melanura). Most larval control applications can result in 80 to 90% control if timed properly which leaves a certain portion of the population to complete their emergence to adults. These adult applications are required to control these situations. The Norfolk County Mosquito Control Project uploads maps of the areas to be treated by 3:30 P.M. the day before the early morning aerosol applications which are conducted between 2 A.M. and sunrise.

d. Adulticides, are the last choice of control measures of the Norfolk County Mosquito Control Project. These products are applied as directed by their respective label, and all equipment used in this process is closely monitored and calibrated by staff.

Operators must consider impact to non-target organisms, impact to water quality, pest resistance, feasibility, and cost effectiveness when evaluating and selecting the most efficient and effective means of pest management to minimize pesticide discharge to waters of the U.S.

2. A brief explanation of the control measures used at the site to reduce pesticide discharge, including evaluation and implementation of the six (6) pest management tools:

1. no action
2. prevention
3. mechanical/physical methods
4. cultural methods
5. biological control agents
6. pesticides

Norfolk County Mosquito Control Project staff considers impact to non-target organisms, impact to water quality, pest resistance, feasibility, and cost effectiveness when

evaluating and selecting the most efficient and effective means of pest management to minimize pesticide discharge to waters of the U.S.

3. Control measures are evaluated separately on the basis of mosquito life stage as follows (See GEIR):

a. Efficacy can be determined from pre and post treatment of larvicides/adulticides. In addition, landing rates can be taken by staff pre/post. See the research link on the Projects web site for more details.

b. Larval control efficacy is easy to access. 24 to 48 hour post-treatment surveys verify and document successful treatments when using biological control measures, such as Bti.

D. Schedules and Procedures.

1. Pertaining to Control Measures Used to Comply with the Effluent Limitations in Part 2.

a. Application Rate and Frequency Procedures.

i. Application Rate Determination

1. Determine species and age of target mosquito(es)

2. Evaluate environmental conditions

3. Consider target area flora and fauna

4. Determine appropriate application rate based on product label recommendations, previous experience and efficacy tests.

ii. Frequency Determination

1. Determine target site treatment history with selected pesticide.

2. Evaluate effect of selected pesticide use on frequency and quantity thresholds for active ingredient.

3. Consider alternate treatment options

iii. Resistance Considerations

1. Consider documented resistance of target species to selected pesticide and/or any other compounds that are in the same class or exhibit similar modes of action. Also consider the possibility of cross resistance. Bottle Assay resistance testing of adult mosquitoes is performed routinely. See webs site research link for details.

2. Consider the use of alternate control options.

b. Spill Prevention Procedures.

i. Perform daily and weekly inspections of pesticide storage areas.

ii. Chemical spill response plan:

1. Contain spill then notify the office (781) 762-3681.

2. Isolate contaminated area.

3. Soak up spill with absorbent pads and/or absorbent granules. Collect material for disposal. In the case of Bti granular pick up using push broom and/or yard rake and flat shovel.

4. Clean contaminated vehicles and equipment according to label instructions.

5. Dispose of contaminated material according to label.

Norfolk County Mosquito Control Project Control Product List and PPE Requirements attached.

c. Pesticide Application Equipment Procedures.

i. Aerial (Helicopter) - larviciding

1. Operations:

a. Application equipment must be calibrated before the application to confirm application rate is in accordance with the label of the pesticide being used. Aerial Contractor JBI Helicopter Services performs these calibrations. The Norfolk County Mosquito Control Project staff have conducted swath width analysis and confirmed an effective width of 70 feet. Aerial contractor uses AgNav GPS tracking system for navigation to and treatment of targeted wetlands. The Norfolk County Mosquito Control Project provides the contractor with wetland GIS data converted to AgNav data. GPS treatment data collected from the AgNav system is converted back to GIS data for review and data storage. See the Norfolk County Mosquito Control Project website for more detailed information on the aerial larval control program.

b. A visual inspection of Ultra Low Volume spray equipment for leaks or wear in the lines, tanks and nozzle is done prior to the start up of spray equipment. Droplet size analyses are performed prior to the season using the Ames Hot Wire system to determine that droplets size range falls within the label specifications (Volume Median Diameter). This droplet analysis can be preformed as needed during the season. The Datamaster software/hardware system also provides sprayer performance monitoring data of the application equipment (see below).

c. Routine cleaning and maintenance of the spray system is performed to ensure system is operating properly.

d. Datamaster GPS tracking system data is reviewed after each application for proper flow rates, vehicle speeds, area covered, adherence to "no spray" request, etc.

2. Maintenance:

i. Daily Checks - Visually check the sprayer each day before use and make any necessary adjustments and /or repairs. Check all gasoline hoses, insecticide lines and fittings for cracks, leaks or wear. Check all bolts and fasteners and tighten as necessary. Replace if needed. Ensure that pesticide tanks are not leaking and have sufficient product for assigned spray mission. Check all nozzle parts for wear or physical damage. Replace damaged parts. Review data collected from the Datamaster ULV tracking system daily for accuracy and for proper sprayer performance.

d. Pest Surveillance Procedures.

Pest Management Strategy

Norfolk 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. This strategy relies heavily on a surveillance driven approach to mosquito management. (See also GEIR)

i. Adult Surveillance

1. Service request telephone messages or emails are databased on a daily basis. This data and data collected from the surveillance traps listed below is used to determine if a given area meets the established threshold and warrants an application. The size of the area treated is based on this data as well as all regional trap data in the area. Many of these are simple requests for treatments, although occasionally such calls lead to finding problems needing attention. Technicians may also, if requested by the office, check for mosquito larvae and determine if adult populations warrant treatment during these inspections. The Norfolk County Mosquito Control Project web site has a link which details the location of surveillance traps and weekly updated charts of numbers collected of the predominate mosquito species. The Norfolk County Mosquito Control Project also has a link where weekly surveillance data and operations are reviewed.

2. Gravid trap collections are paramount to our WNV surveillance. This trap type is particularly effective in catching gravid (egg bearing) Culex pipiens/restuans, which is our primary WNV vector. Gravid traps are deployed throughout the county each week during the mosquito season. See the "trap map" link on the Projects website for locations and collection data. Might consider picture of trap and map where traps located.

3. Carbon dioxide (CO₂) baited light trap collections are used for nuisance mosquito monitoring and for collections of mosquitoes for submission to the state arbovirus lab. See the "trap map" link on the Projects website for locations and collection data.

ii. Larval Surveillance

1. Field Technicians will check for mosquito larvae in response to requests from residents and/or public officials. These requests for service are generated as a result of stagnant water observed by the property owner on or near their property. Many times these are annual calls as the resident knows these areas develop mosquitoes each spring and/or summer. During these visits Field Technicians will dip for larvae. Often Field Technicians will observe artificial containers with larvae developing in them. These situations are easily remedied by simply dumping water from articles such as buckets, birdbaths, tarps, and other items that are holding water. Field Technicians will educate the landowner on how to prevent larval development in these containers using source reduction techniques. Occasionally, service request investigations uncover larger scale problems which are then added to the ground or aerial wetland GIS maps. If a small ground larval site is identified the Field Technicians will treat the area with Bti while on site. Larger areas will be identified on the GIS maps for review for future aerial larval control applications.

2. Larval habitat site inspections are conducted by our Field Technicians prior to any larval applications (both ground and aerial). Field Technicians will check following flooding events caused by rains, or spring/lunar tides. Larval surveillance entails locating the larval source (if not already known), sampling for larvae and estimating larval density, determining larval developmental stage(s), and collecting larvae for identification purposes. Other factors considered during larval inspections include the water depth at the specific location, wetland habitat type, current extended forecast, water temperature, and if any natural predators are present.

iii. Disease Surveillance

Norfolk County Mosquito Control Project works closely with the Massachusetts Department of Public Health (DPH) to monitor for West Nile Virus (WNV) and Eastern Equine Encephalitis Virus (EEEV) activity and to help determine the level of human risk. Mosquito pool analysis is a most useful indicator of the presence of WNV and EEEV in our service area. Up to 50 adult mosquitoes (selected based on guidelines from the State Dept. of Health) are grouped by species to form a single sample (pool) and sent to the arbovirus lab on a weekly basis for sampling of WNV or EEEV virus. These weekly submissions continue from early June typically through September subject to limits set by the State Department of Public Health.

e. Assessing Environmental Conditions Procedures.

i. Larval mosquito treatments. Project staff closely monitors the development of larvae prior to biological pesticide applications for the purpose of determining the best timing for these applications. Pre/Post larval surveys are conducted to determine coverage and efficacy of the application.

ii. Climatic conditions are always checked prior to any aerial or ground applications. Wind speed, wind direction, and the possibility of impending rain are taken into consideration while aerial applying granular Bti products to prevent drift off site. Wind and temperature also play a role in our application methods, especially the timing of Ultra Low Volume ground aerosol applications. All ULV applications are suspended at sunrise.

1. Ground Adulticiding Procedures

a. Apply when insects are most active and meteorological conditions are conducive to keeping the spray cloud in the air column close to the ground.

b. Apply during the cooler hours of the early morning when thermal activity is low. Product is not applied when ambient temperature is less than 50 F.

c. Apply when ground wind speeds are equal to or greater than 1 mph but do not exceed 10 mph.

d. Product is not applied over bodies of water (lakes, rivers, permanent streams, natural ponds, commercial fish ponds, swamps, marshes or estuaries), except when necessary to target areas where adult mosquitoes are present, and weather conditions will facilitate movement of applied material away from the water in order to minimize incidental deposition into the water body.

e. Pesticide is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Product is not allowed to drift when bees are actively visiting the treatment area, except when applications are made to prevent or control a threat to public and/or animal health determined by a state, tribal or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes, or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort.

iii.

2. Pertaining to Other Actions Necessary to Minimize Discharges.

a. Spill Response Procedures.

i. Chemical Spill Response training is required for staff handling, loading or applying pesticides.

b. Adverse Incident Response Procedures.

- i. Procedures for responding to any incident resulting from pesticide applications
- ii. Procedures for notification of an incident:
 - 1. Staff notifies office of incident (781) 762-3681. The office will determine if the National Pesticide Telecommunications Network – 800/858-7378, National Spill Response Center – 800/424-8802 need to be contacted.
 - 2. Massachusetts Department of Environmental Protection, Emergency Response section will be called at (888) 304-1133
 - 3. The Norfolk County Mosquito Control Project will notify the town where incident occurred to coordinate any needed remediation.
 - 4. The Norfolk County Mosquito Control Project will notify Lee Corte Reale, Chairman of the State Reclamation and Mosquito Control Board – phone 617-626- 1776
Phone: 617-626-1715 for notification purposes and for further guidance.
- c. Pesticide Monitoring Schedules and Procedures.
 - i. For application by, or under the supervision of, personnel certified/trained in public health pest control or mosquito control. For each application, a record must be kept of (at a minimum):
 - 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.

Aerial Larval Control Calibration Protocol

- 1. see JBI Helicopter Services protocol.

Pesticides and Required PPE

See product labels and MSDS sheets

Larvicides currently used at Norfolk County Mosquito Control Project

- Altosid 30 day briquets: EPA Reg. # 2724-375
- Altosid XR 150 day briquets: EPA Reg. # 2724-421
- Vectobac G EPA Reg. # 730 49-10
- VectoLex WSP EPA Reg. # 730 49-20
- Fourstar Briquets EPA Reg# 83362-3

Adulticides currently used at Norfolk County Mosquito Control Project

For Ultra Low Volume aerosol applications

Trade Name: Duet™ Duel-action Adulticide

Formulation: 1% Prallethrin, 5% Sumithrin, 5% Piperonyl Butoxide, 89% other ingredients

EPA Reg. # : 1021-1795-8329

For Barrier applications

Trade Name: Mavrik Perimeter

Formulation: 22.3% Tau-fluvalinate, 77.7% Other ingredients

EPA Reg. # : 2724-478

Seasonal Timeline:

March through May:

- Water management activities March through early April
- Ground & Aerial larval control applications early April through May
- Ground ULV control applications late May
- Surveillance activities larval surveys March through May, adult surveys May
- Equipment maintenance on going as needed during period
- Off loading of pesticide products on going during period
- Data management and analysis, map preparation on going during period

June through September:

- Ground & Aerial larval control applications including rain basin treatments during period as needed
- Ground ULV control applications during entire period as needed
- Barrier applications as needed during entire period as needed.
- Surveillance activities larval surveys & adult surveys during entire period including weekly submission of mosquito pools to MDPH
- Equipment maintenance on going as needed during period
- Data management and analysis, map preparation on going during period
- Low flow water management projects conducted when required during the low flow period.

October through early December:

- Surveillance activities adult surveys continue until mid to late October including weekly submission of mosquito pools to MDPH
- Water management activities resume during this period (most active period for this activity).
- Data management and analysis continue
- Equipment maintenance on going as needed during period

December through February:

- Water management projects conducted if weather permits.
- Employees encouraged to take vacation time during this period.
- Maintenance of facility and equipment (mainly during extreme weather events):

Equipment:

- winterize/de-winterize ULV sprayers
- fleet maintenance/repairs
- heavy equipment (excavators) maintenance/overhauls
- general equipment welding, repairs
- repairs and servicing of various surveillance equipment (CDC Light traps/Gravid traps/regulators, etc)

Facility:

- facility organization (vehicle storage areas, insecticide storage areas)
- cleaning and painting
- hazardous waste removal preparation activities (coordination with vendor)

- insecticide management (receiving of large inventory deliveries)
- training (including Operations training, Right-to-Know Law, etc)
- preparations for internal inspections
- snow removal when necessary

Office:

- review of complain call/fieldwork accomplished data bases for accuracy necessary for data analysis
- preparation of GIS data/overlays for next season aerial/ground larval control applications including meeting with contracted helicopter company/pilots
- securing permission for aerial landing zone sites, review of aerial vendor insurance documents, etc.
- review of and analysis of previous season surveillance data as feedback for next season larval/adult control efforts
- revision of endangered species habitat GIS layers as well as other exempt locations such as schools, daycares relative to the Children and Family Protection Act (these overlays are incorporated into the ULV units GPS navigation systems)
- staff training including attendance of regional and national mosquito control conferences as well as preseason strategy sessions with SRMCB & MDPH
- schedule time during off season with computer software/hardware vendors for off season maintenance of computer systems/software/network

The scheduling of these activities, although necessary each year, is usually reserved for extreme weather events such as heavy snow events and/or periods of extreme temperatures. The majority of the off season work is in support of the water management program. This involves the monitoring of/hand clearing of/brushing of and/or mechanized excavation of mosquito ditches. Even during extreme freezes work can normally continue in coastal salt marsh locations due to the lack of frozen conditions found year round in these areas.

PERMIT NUMBER: MAG87A021

Your Permit Number will be used to identify this record and the associated Pest Management Areas.
Record the permit number above for use when modifying or terminating your record in the future.

Permit Status: **Submitted to EPA**

Operator Information

Operator Name:Norfolk County Mosquito Control District

IRS Employer Identification Number (EIN):

Operator Type:Mosquito control district (or similar)

Are you a large entity as defined in Appendix A of the PGP? (check one):Yes

Mailing Address

61 Endicott St, Bldg #34
Norwood, Massachusetts 02062-3052

Phone:7817623681

Fax: 7817696436

Email: ncmcpdl@verizon.net

Contact Name: David Lawson

Pest Management Area Name:Norfolk County Mosquito Control District

Pest Management Area Description:

All waters of Norfolk County Massachusetts except the towns of Brookline, Cohasset and Wellesley.

Mailing Address

61 Endicott St, Bldg #34
Norwood, Massachusetts02062-3052

Phone:7817623681

Fax:7817696436

Email:ncmcpdl@verizon.net

Will Pesticide applications occur on Indian Country Lands?

No

Are any of your activities (in this pest management area) for which you are requesting coverage under this NOI considered "federal facilities" as defined by the PGP?

No

Pesticide Use Patterns to be included in this Pest Management Area

Mosquitoes and Other Flying insect Pests

Receiving Waters

Coverage requested for all waters of the United States within the Pest Management Area identified above.

Is coverage requested for discharge to a Tier 3 (Outstanding National Resource Water) water of the United States?

No

Water Quality Impaired Waters

Waters are NOT impaired by any substance which is either an active ingredient of a pesticide to be discharged or a degradate of such an active ingredient

Endangered Species Protection:

Pesticide application activities will not result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, of the PGP.

Certifier

Printed Name:David Lawson

Title:Assistant Director

Email:ncmcpdl@verizon.net

Preparer

Preparer Name:David Lawson

Organization:Norfolk County Mosquito Control District

Phone:7817623681

Email:ncmcpdl@verizon.net