Massachusetts Emergency Operations Response Plan for Mosquito-Borne Illness

Last Revised: August 2024

State Reclamation and Mosquito Control Board
Massachusetts Department of Agricultural Resources (MDAR)
225 Turnpike Road, 3rd Floor, Southborough, MA 01772
http://www.mass.gov/eea/agencies/agr/pesticides/mosquito

Board Members:
Ashley Randle (Chair), Department of Agricultural Resources (MDAR)
Mia McDonald, Department of Environmental Protection (DEP)
Jim Straub, Department of Conservation and Recreation (DCR)

Staff:
Alex Giannantonio, Operations Coordinator
Jennifer Forman Orth, Ph.D., Environmental Biologist
Jessica Burgess, Esq., General Counsel

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Revision Tracking (substantial changes made to this plan)

Date	Section Revised	Author
7/2014	Last major revision finalized	Mark Buffone
3/2016	All sections revised to draft	Katherine McAuliffe
10/2016	2017 revision begun	Jennifer Forman Orth
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1/2020	General review including response checklist	Jennifer Forman Orth
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5/2024	2024 Revision	Jennifer Forman Orth
8/2024	Minor Revisions including staffing updates	Jennifer Forman Orth

Introduction

In Massachusetts, there are several mosquito-borne viruses that present a threat to human health or the health of domestic or wild animals. These insect-borne viruses (arboviruses), particularly Eastern Equine Encephalitis virus (EEEv) and West Nile virus (WNV), have a history of causing disease outbreaks in our state. The following actions occur annually, in an effort to reduce the risk of arbovirus transmission in mosquitoes:

- Routine surveillance and treatment of adult and larval mosquitoes
- Management of mosquito habitat, done by established mosquito control districts
- Educational outreach to increase public awareness and encourage the public to protect themselves from mosquito bites and to do their part to reduce mosquito habitat

Through cooperative efforts between state agencies and regional mosquito control districts and projects (MCDs) that operate under the State Reclamation and Mosquito Control Board (SRB), the state has performed these functions for decades, and is well-informed about techniques to reduce mosquito populations. However, factors sometimes combine to create elevated levels of arbovirus regardless of the actions described above, making it necessary to perform intensified ground-based or aerial larviciding treatments, or in some cases, aerial adulticide applications. This document is a guide to the process by which stakeholders prepare for, discuss, and, if needed, execute a plan to perform an emergency arbovirus intervention.

Emergency interventions related to mosquito-borne illness are overseen at the state level by the SRB, housed within the Massachusetts Department of Agricultural Resources (MDAR). All mosquito control activities are performed pursuant to the provisions of Chapter 252 of the Massachusetts General Laws, as amended, and special legislation, along with all other applicable federal, state, and local statutes and regulations.

Goals of this document

Objectives

The objectives of this plan are to:

- Identify in detail all stakeholders involved in assessing and responding to elevated risk of mosquito-borne disease, including the SRB, MCDs, partner agencies, and associated organizations
- Outline the process for preparation, planning, and response to the risk presented by mosquito-borne disease
- Provide protocols for evaluating efficacy and environmental impact of an arbovirus intervention such as an aerial adulticiding event

Scope

This plan establishes a framework for operations within Massachusetts in response to the elevated risk of mosquito-borne disease. The scope of this framework includes:

- Listing all stakeholders and outlining their roles in arbovirus response. This includes but is not limited to the SRB, MCDs, and any other associated state or municipal agencies and partner organizations involved in the process.
- Acting as a companion document to the current version of the Massachusetts Department of Public Health (DPH) Arbovirus Surveillance and Response Plan.
- Summarization of the multi-agency response that occurs when arbovirus surveillance data warrant mosquito control through the aerial and/or ground application(s) of pesticide.
- Descriptions of the specific activities that are conducted during a mosquito-related public health hazard.

This document is subject to changes as needed. For details, see the Revision Tracking page (p.2).

Legislative Authority

The authority of participating state and local agencies to respond to projected or current outbreaks of mosquito-borne disease, and to exercise powers where necessary, includes the following Chapters of Massachusetts General Law (M.G.L.):

- M.G.L. c. 252: Establishes the SRB and sets forth statutory requirements and oversight procedures for managing mosquito populations in infested areas throughout the Commonwealth, whenever the SRB considers such activities to be necessary or useful. This includes oversight of MCDs as well as areas throughout the Commonwealth that are not part of an established MCD. . Under M.G.L. c. 252, Section 8, if the SRB concludes that certain improvements will benefit public health, the costs will be paid by the Commonwealth, and the SRB must separately estimate that part of the expense, to be included with other estimates under M.G.L. c. 29, Section 4. The MCDs perform work under both M.G.L. c. 252 and individual enabling legislation, as amended, as applicable.
- M.G.L. c. 132B, Massachusetts Pesticide Control Act: Incorporates the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and further designates MDAR as the state's lead agency for implementing and administrating pesticide laws within the Commonwealth. Under M.G.L. c. 132B, MDAR is responsible for registering all pesticides for use in the Commonwealth as well as issuing all certifications and/or licenses in their legal use. MDAR is also charged with enforcement regarding this use, which includes transportation, sales, and application of all pesticides within the Commonwealth.

Roles and Responsibilities

DPH, the SRB/MDAR, and the MCDs are the principal entities responsible for the monitoring, detection and analysis of mosquito activity, as well as the implementation of interventions to protect the public from mosquito-borne disease (see Appendix 3). The MCDs provide further mosquito surveillance and control for member municipalities across the state. The Mosquito Advisory Group (MAG) is a non-governmental partner that provides expert technical advice to the SRB and DPH. Other key agencies and entities involved in mosquito surveillance and emergency response are listed and described below:

State

- Executive Office of Energy and Environmental Affairs (EOEEA or EEA)
    - State Reclamation and Mosquito Control Board (SRB)
        - Mosquito Control Projects/Districts (MCDs)
    - Massachusetts Department of Agricultural Resources (MDAR)
    - Massachusetts Department of Environmental Protection (DEP)
    - Massachusetts Department of Conservation and Recreation (DCR)
    - Massachusetts Department of Fish and Game
        - Division of Fisheries & Wildlife, Natural Heritage and Endangered Species Program (DFW)
        - Division of Marine Fisheries (DMF)
- Massachusetts Department of Public Health (DPH) (under the Executive Office of Health and Human Services)
    - Bureau of Environmental Health (BEH)
    - Bureau of Infectious Disease and Laboratory Sciences (BIDLS)

Federal

- U.S. Environmental Protection Agency (EPA)

Other

- Mosquito Advisory Group (MAG)

Agency Roles: Detailed Descriptions

Executive Office of Energy and Environmental Affairs (EEA)
EEA participates as needed in aspects of communications, planning, and facilitating emergency mosquito control operations.

State Reclamation and Mosquito Control Board (SRB)
The SRB oversees mosquito control operations in Massachusetts. It acts as a resource for municipalities for all mosquito-associated concerns, whether in response to a public health situation or to the overall nuisance caused by mosquitoes. This oversight applies not only to existing MCDs but also to any mosquito surveillance or arbovirus testing, or any mosquito control efforts provided by a municipality (including contractors employed by the municipality). The SRB establishes administrative and technical policy, guidelines, and best management practices to ensure that mosquito control programs are effective and safe. The SRB also works cooperatively with DPH regarding all aspects of planning and response to mosquito-borne diseases that pose a risk to human health.

The SRB, housed within MDAR, is a 3-person public body made up of representatives from 3 different agencies: MDAR, DCR, and DEP. The SRB also funds MDAR support staff to provide assistance with various mosquito control-related tasks. These staff include:

- SRB Operations Coordinator
- Financial Staff
- Legal Staff
- Environmental Biologist

More information about SRB staff roles can be found in the section marked “Massachusetts Department of Agricultural Resources (MDAR)” below.

Mosquito Control Districts and Projects (MCDs)
The eleven organized MCDs are located throughout Massachusetts (Figure 1). They include nine fully functional districts, plus Pioneer Valley (which provides surveillance to all member municipalities, and larviciding upon request), and Dukes County (which currently provides surveillance only). They operate under the aegis of the SRB pursuant to the provisions of M.G.L. c. 252 and enabling legislation, as amended. Each MCD also operates under the direction of a Commission appointed by the SRB (with the exception of the Dukes County Mosquito Control District, which contracts out for mosquito surveillance and is managed by the Dukes County Manager). The MCD Commissions represent the interests of their member communities, their residents, and the SRB, by providing oversight of MCD activities and ensuring that member communities receive services that are consistent with applicable laws and justified by tenets of

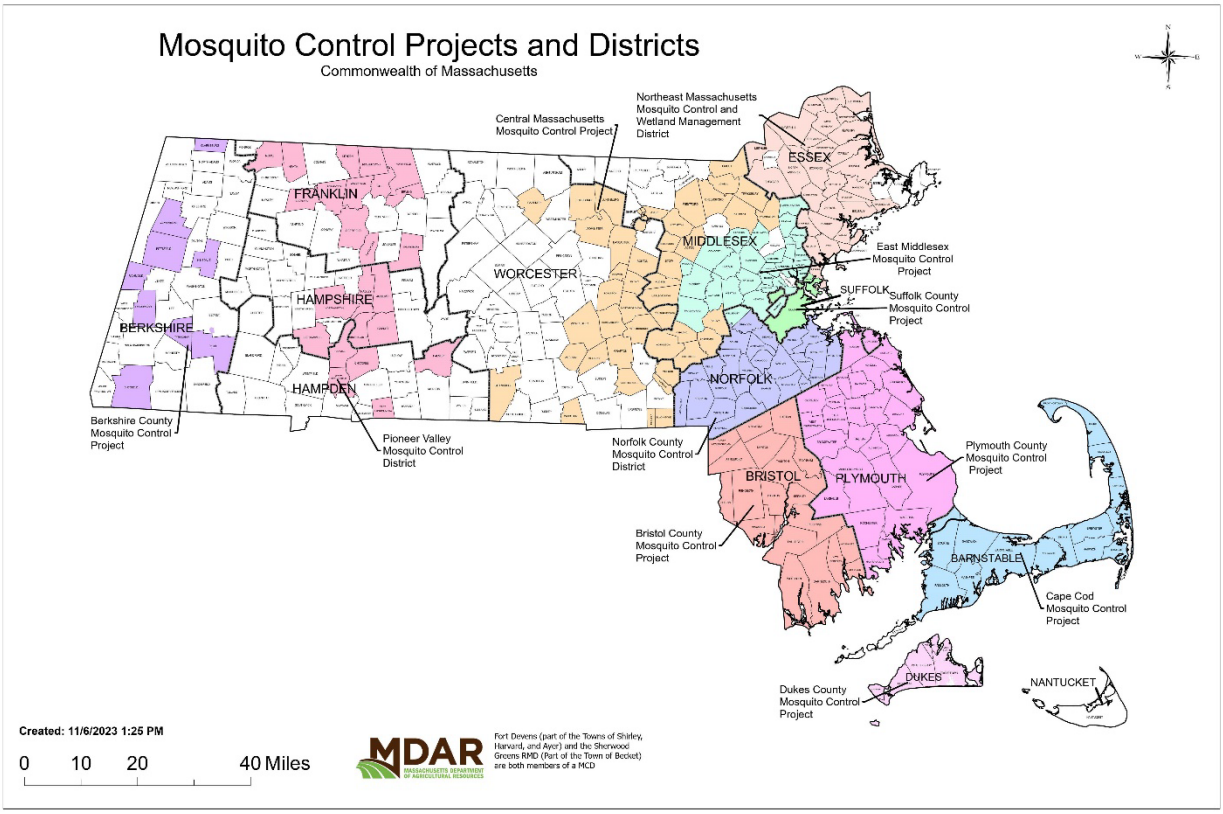
Integrated Pest Management (IPM), public health, vector control, environmental safety, and fiscal responsibility.

The MCD Commissions represent the interests of their member communities, their residents, and the SRB, by providing oversight of MCD activities and ensuring that member communities receive services that are consistent with applicable laws and justified by tenets of IPM, public health, vector control, environmental safety, and fiscal responsibility. A current list of MCD superintendents and Commissioners can be found here.

MCDs serve as critical components in the surveillance network, performing mosquito management activities in order to reduce mosquito populations as well as reduce the risk of mosquito-borne diseases. MCDs coordinate mosquito surveillance within their service areas, including surveillance of larval habitat, deployment of traps for adult mosquitoes, collection and identification of trap catches, and submission of mosquitoes and associated data to DPH so that arbovirus testing can be performed. MCD personnel have knowledge of local habitats and understanding of management techniques that are a key part of reducing mosquito populations, and consequently, the transmission of mosquito-borne viruses. The level of mosquito management provided differs among the various MCDs, though the majority respond to arbovirus-positive mosquito pools (batches of mosquitoes submitted for testing) or animal or human cases of arbovirus by performing larviciding and in many cases adulticiding as well. Most MCDs also perform ditch management or other habitat management activities in order to reduce mosquito populations within their service area. The MCDs provide weekly summaries to the SRB about mosquito abundance and diversity, local weather conditions, and mosquito control activities in their region, an important part of the SRB understanding of arbovirus risk. Each MCD also provides an annual summary of mosquito control activities, which can be viewed here.

The regional programs of the MCDs currently cover 232 municipalities (see Figure 1). MCDs are typically managed by a director or superintendent and have staff to manage day-to-day mosquito control operations. Mosquito control activities performed by or for non-member municipalities (including regional mosquito control programs that are limited to surveillance only) are also subject to the provisions of M.G.L. c. 252, along with other applicable federal, state, and local statutes and regulations. However, the municipalities or private contractors performing this work do not operate as state entities. The SRB and DPH have connections to the local Boards of Health and the contractor in each community, but in the case of an elevated risk of arbovirus that would require additional action, there is not currently a fully functional MCD available to assist with coordination of mosquito control activities in those communities that are not currently members.

Figure 1: Map showing Mosquito Control Districts/Projects



Massachusetts Department of Agricultural Resources (MDAR)

In addition to housing the SRB, MDAR also provides staff for and manages the following mosquito control-related tasks at the direction of the SRB:

- An employee of MDAR sits on the SRB pursuant to M.G.L. c. 252, and currently serves as Chair.
- The Operations Coordinator manages business activities on behalf of the SRB and MCDs, assists with financial and legal reports, manages the aerial spray contracts, works closely with the MCDs and MDAR, and provides a communication link between MCDs, SRB, MDAR and other partners.
- Financial Staff assist with procurement, vendor payments, processing of internal service agreements with DPH for testing fees, budget management for MCDs, work with EEA Fiscal and the Executive Office of Administration and Finance (ANF) on emergency supplemental request for funds during an arbovirus emergency.
- MDAR administration and agency staff co-lead the mosquito operations team, provide technical expertise in the regulation of pesticides, and are responsible for cross-agency communications to EEA.

- Legal Counsel advises SRB and MCDs on all legal issues, provides assistance with understanding the nuances of all legislation that governs mosquito control activities in the state.
- An Environmental Biologist analyzes mosquito surveillance and disease testing data, provides stakeholders with annual reports, and reviews operational response plan and other policy documents to ensure sound science policy.
- The GIS Lead provides mapping of aerial spray areas and acquisition and compilation of exclusion information for organic farms, aquaculture facilities, etc. This position also coordinates the multi-agency GIS Team, organizing yearly check ins at the start of each mosquito season, and dry runs of mapping operations as needed.
- The IT Lead oversees website management, including working with the GIS Lead to develop and deploy tools to share mapping data online.
- The Legislative Director (currently MDAR's Assistant Commissioner) performs outreach to Legislators in impacted areas during an arbovirus emergency.

MDAR conducts a yearly internal check in with staff at the beginning of each season to inform them of the current arbovirus situation, and also checks in with vendors to ensure availability of airplanes, pilots, and pesticide product. MDAR also coordinates the multiagency group that assesses pesticides for use in emergency operations (see "Pesticide Use Approval" on p. 16).

Information about current MDAR staff working on mosquito-related issues can be found in Appendix 2.

Massachusetts Department of Environmental Protection (DEP)

- Provides one staff member to serve on the SRB, pursuant to M.G.L. c. 252
- Oversees protocols for surface water protections
- Provides GIS shapefiles of drinking water supply reservoirs for use in establishing aerial spray exclusion zones
- Assists with assessments of surface water done pre- and post- application in the event of an emergency wide-area pesticide application
- Participates in the review of pesticides as part of the pesticide selection process

Massachusetts Department of Conservation and Recreation (DCR)

- Provides one staff member to serve on the SRB, pursuant to M.G.L. c. 252

Massachusetts Department of Fish & Game (DFG)

Division of Fisheries & Wildlife (DFW), Natural Heritage and Endangered Species and Fisheries Programs

- Works with the SRB/MCDs to outline protocols to protect state-listed species during mosquito control activities, using the designation of Priority Habitat for these flora and fauna
- Provides GIS shapefiles to the SRB and MCDs of the subset of Priority Habitats relevant to planning emergency arbovirus interventions
- Responds to reports of potential fish kills following an aerial spray or other emergency mosquito control operation
- Participates in the review of pesticides as part of the pesticide selection process
- Provides locations of fish hatcheries and aquaculture facilities so that these properties can be excluded from aerial operations
- Provides ecological or biological input, as needed, on any other fish and wildlife matters related to emergency operations
- Monitor impacts of emergency operations on state-listed species, as determined necessary and feasible by DFW

Division of Marine Fisheries (DMF)

- Participates in the review of pesticides as part of the pesticide selection process
- Provides ecological or biological input, as needed, on any other fish and wildlife matters related to emergency operations

Massachusetts Department of Public Health (DPH)

DPH conducts arbovirus surveillance and testing, develops disease risk assessments, and disseminates public information relating to mosquito-borne disease. DPH also provides information, including but not limited to arbovirus risk assessments, that assists the SRB with taking appropriate steps under its authority set forth in M.G.L. c. 252. DPH's assessment of risk associated with mosquito-borne diseases such as EEEv and WNV is based on the most current DPH Arbovirus Surveillance and Response Plan, which describes the protocols for collecting and analyzing data for evidence of mosquito-related public health issues. DPH staff analyzes surveillance data and issues weekly summaries including risk level maps for both EEEv and WNV. Detailed versions of these reports are communicated to key state agencies, MCD staff, and MAG members; an online summary can be accessed here. DPH also issues press releases about risk level changes and human and animal cases of arbovirus, and informs local Boards of Health and other entities as needed over the course of the season.

DPH participates in the review of pesticides as part of the pesticide selection process and works with staff at MDAR and DEP to develop and maintain a list of frequently asked questions about aerial spraying of mosquito adulticide. DPH also addresses health concerns related to mosquito

control pesticide applications. If an aerial adulticide application is undertaken, DPH implements a surveillance system for possible pesticide-related illnesses.

Environmental Protection Agency (EPA)

In the event that it is determined that application of an aerial adulticide is needed, MDAR must provide notice to the EPA (see CONOPS below for details). MDAR may also contact the EPA, in the event of the certification of a public health hazard, to ensure compliance with applicable federal laws, and to obtain any necessary federal exemptions. This requirement will depend on the pesticide selected for the application.

Mosquito Advisory Group (MAG)

The SRB established the Mosquito Advisory Group (MAG) to provide independent scientific advice regarding the justification, timing, location, and options for intervention tactics to prevent or suppress infected mosquito populations that may otherwise result in an outbreak of disease in people and animals. MAG members serve voluntarily on an as-needed basis, and are selected for their expertise primarily by the SRB, with input and approval from DPH. Each MAG member is a recognized expert in their field and provides independent assessments and advice to the SRB. MAG members may also attend SRB and other mosquito-related meetings, or participate in workgroups established by DPH or SRB. A current list of MAG members can be found in Appendix 5.

Concept of Operations (CONOPS)

The Concept of Operations is the system by which emergency operations are conducted. The plan outlined in this document is activated when a mosquito-borne disease threat or establishment of a new high-risk mosquito species is already occurring or imminent.

This system includes any ongoing mosquito surveillance, regardless of whether it is part of the response operation. The MCDs and DPH each conduct surveillance in order to 1) determine what mosquito species are present, and at what population levels and 2) capture mosquitoes in order to test them for the presence of mosquito-borne virus. This process is part of normal operations and takes place both prior to and concurrently with any response operations. While the mosquito season typically spans June through October, regular operations may involve surveillance and larvicide applications treatment for mosquito larvae as early as March. For detailed information about determination of arbovirus risk levels and associated activities, see Appendix 3. For a graphical representation of the process that leads to determination that an aerial spray or other emergency operation is necessary, see Appendix 4. For a checklist of tasks to be completed during emergency operations, see Appendix 12. For a quick reference chart, see Appendix 13.

Both DPH and MDAR produce weekly reports during the mosquito season, in order to communicate findings from surveillance and testing, along with any adjustments to the risk level for mosquito-borne illness. The MCDs provide updates to MDAR to include in those weekly reports, and several MCDs also produce their own separate reports. Please reference the **Notifications** section for additional reporting requirements.

Ongoing activities (Pre-Activation)

These activities continue through the mosquito season, and correspond to a DPH risk level of REMOTE or LOW. Responsible party is indicated at the end of each bullet in parentheses:

- Surveillance of mosquito population levels (MCDs, DPH, or private contractors working directly with municipalities or the SRB)
- Implementation of Best Management Practices (BMPs), such as Integrated Pest Management (IPM), to reduce populations of immature and adult mosquitoes (MCDs, municipalities, or private contractors working with municipalities or the SRB)
- Testing of mosquitoes for the presence of mosquito-borne disease (DPH)
- Larvicide and adulticide applications, where deemed necessary, based on surveillance, the guidelines set in the Generic Environmental Impact Report (GEIR), and other relevant data, including arbovirus activity from the previous season(s), and any evidence indicating an outbreak cycle (MCDs, and/or the SRB)

This includes, but is not limited to, the following:

- Application of larvicide, by hand, backpack sprayer, or truck, to culverts, ditches, catch basins, abandoned swimming pools, etc.
- Aerial application of larvicide, by plane or helicopter, to open water sources
- Adulticide treatments via backpack sprayer or ground-based truck-mounted Ultra-Low-Volume (ULV) equipment
- Habitat management, when deemed necessary, to maintain larval control or reduce adult mosquito habitat (occurs year-round) (MCDs). This includes, but is not limited to, the following:
    - Cleaning of culverts
    - Ditch management
    - Tire removal

Elevated awareness/preparedness

This corresponds to a DPH risk level of MODERATE. Operations expand or intensify over the course of the mosquito season where needed, including the following:

- Areas near positive virus findings
- Areas where high concentrations of mosquitoes that carry mosquito-borne illnesses are known to occur
- Areas where disease outbreaks have occurred in previous years
- Areas where new mosquito species with the potential to carry arbovirus have been identified.

In a municipality that has been assigned an arbovirus risk of MODERATE by DPH, MCDs (or in cases where no MCD is present, DPH, or the local Board of Health/SRB working through a contractor) typically proceed with supplemental trapping to monitor mosquito populations*. MCDs may also perform ground-level adulticiding and/or ground-level or aerial larviciding of mosquitoes. An affected area typically encompasses a "focal area" of a multiple-mile radius circle or larger around positive virus findings, and could include multiple municipalities. The delineation of this area depends on a number of factors, including the following:

* Verification of the presence of arbovirus-positive mosquito pools, or human or animal cases of arbovirus, is performed by DPH and may be subject to DPH protocols regarding surveillance, trapping, and testing processes.

- Location and frequency of arbovirus finds from the previous season, particularly if the state is in the middle of a multi-year outbreak cycle
- Early and escalating activity of those mosquito species that drive the EEEv cycle
- Early and escalating arbovirus activity
- The species of mosquitoes found to be arbovirus-positive
- Location and density of residences near positive findings
- Types of habitat that would need to be targeted in order for treatment to be most effective
- Seasonal conditions present that may be conducive to risk of human cases of arbovirus (precipitation, heat, etc.)

Initial Emergency Response

This corresponds to a DPH risk level of MODERATE (trending towards HIGH) or HIGH, typically for EEEv, but potentially for other arboviruses or for newly introduced mosquito species (such as Asian tiger mosquito) that could potentially carry arbovirus. Triggers include, but are not limited to, the following:

- Presence of a significant number of arbovirus-positive mosquito pools
- Presence of arbovirus-positive mosquito pools in an area not typically known to have a high risk
- Human or animal cases of arbovirus (particularly EEEv) within or in direct proximity to Massachusetts
- Occurrence of weather conditions conducive to rapid or massive increases in populations of mosquito species known to carry arboviruses such as EEEv. This includes significant rainfall events, flooding, and/or high temperatures
- Significant finds of new, high-risk mosquito species

At this stage, DPH, MDAR (including SRB staff), impacted MCDs, and MAG should begin discussions to determine the potential need for an aerial adulticide application or other emergency mosquito control intervention. To ensure that all stakeholders are kept informed about these discussions, these organizations will do the following:

- DPH: Notify local Boards of Health (BOH) and also check in with the appropriate MCD(s)
- MCD superintendents: Notify their own Boards, and also check in with other local stakeholders (including local BOH and other town officials as warranted)
- MDAR: Notify the Secretary of the EEA and keep EEA updated, check in with the appropriate MCD(s), make sure the Department of Fish and Game (DFG) is aware, and ensure MAG is kept up to date. Also, SRB staff within MDAR will notify SRB

members so that they can notify their respective commissioners and their contacts at EEA

Depending on the severity of the situation and whether the state is in the middle of an arbovirus outbreak cycle (EEE cycles typically last 2 to 3 years), DPH may provide risk assessments to be reviewed by the SRB, MDAR, MAG, and the MCDs, and may also provide advice to MDAR and the MCDs regarding the need for additional ground-based mosquito control activities. After discussion between these groups, DPH may take further action, including the issuance of certifications that may allow MDAR to waive certain regulatory requirements, in order to allow MCDs or the SRB to conduct additional pesticide applications. If the risk level reaches HIGH, MCDs and/or the SRB (using contractors) may intensify existing ground-level adulticiding efforts in areas where arbovirus-positive mosquito pools or animal or human cases are found.

MDAR, on behalf of the SRB, will review any existing vendor contracts (for emergency response, pesticide procurement, and efficacy testing), check in with any vendors on contract to confirm availability of staff and/or products, and confirm availability of any needed staging areas (see Appendix 7 and Appendix 11). MDAR should also review documentation regarding appropriate pesticide selection, extent and method of treatment, and treatment areas to target, and should advise the Commissioners of any other impacted agencies (Department of Fish and Game, Department of Environmental Protection, etc.) as to whether an intervention coordinated by the SRB, including aerial adulticide application, may be warranted.

DPH will consider the issuance of a certification that pesticide application is necessary to protect public health, which will allow certain regulatory waivers to be issued by MDAR pursuant to 321 CMR 10.04(3)(e)) and 333 CMR 13.03(3)(b).

If, despite the increased ground-level response, risk levels continue to rise, or the number of municipalities at HIGH or CRITICAL risk continue to increase, and upon discussion between MDAR and DPH that aerial application may be necessary, the response will proceed to the next step of developing a map of the potential spray area.

Pesticide Use Approval

Staff from MDAR, DPH, DFG, and DEP meet each spring to evaluate potential pesticide products for use in aerial spray. By May before each mosquito season, MDAR toxicology staff will review literature on any pesticides currently approved for aerial application, and present the results of this review to the group. MDAR staff will also determine whether there are any additional products that should be considered for approval, and if so, will prepare evaluations for the group to review. Each calendar year, the SRB selects a product

based on this review, prior to any aerial application. Please see Appendix 8 for a current list of pesticide products selected for potential use.

Securing of Emergency Funding

If required, the SRB/MDAR will reach out to EEA (through the Executive Office for Administration and Finance) to secure emergency funding to cover operational costs. While emergency response contractors are activated as soon as the SRB/MDAR have determined that an aerial pesticide application may be necessary, securing the supplemental funding is done concurrently with emergency response preparations, and total costs are often not obtained until after the operation is complete. When the Commonwealth anticipates a multi-year EEEv or other arborvirus outbreak cycle, MDAR's CFO will advocate to EEA and ANF to set aside funding in the MDAR administration account for aerial spray or other emergency operations for the upcoming mosquito season.

Key actions that need to occur alongside operational emergency response preparations include:

- MDAR and SRB staff work to determine all estimated costs of the emergency response operation
- MDAR's Fiscal Office works with EEA Fiscal and ANF on an emergency supplemental request for funds
- MDAR's Legislative Officer (currently the Assistant Commissioner) keeps legislators in the impacted areas informed

Determination of Spray Area

Upon agreement between MDAR/SRB, DPH, the appropriate MCDs, and MAG that an aerial pesticide application or other emergency arbovirus intervention is warranted, DPH will characterize the area of risk based on current surveillance information, habitat, areas of historical activity likely to contribute to current risk, and known patterns of virus spread, and will produce a map that delineates the perimeter of the proposed area for pesticide application. Information will be shared using the Microsoft Teams platform (see the Notifications/Communications section for details).

Delineation of Area of Operations

The GIS Team (MDAR/DPH/DEP/DFW) takes the map produced by DPH and combines it with map layers of the following no-spray zones:

- Certified organic farms
    - In early spring of each year, MDAR staff update the list of certified organic growers, using data from the USDA and from organic certifiers. These growers are contacted by MDAR (either directly, or through reminders

shared through organizations such as the Northeast Organic Farming Association (NOFA)) and asked whether they would like to be excluded from emergency aerial sprays. If so, they must then either provide a map to MDAR, or use MDAR's online mapping tool to identify their parcels. MDAR's GIS Team will then create a map layer of these exclusions to be used if emergency operations are undertaken by the SRB.

- Note that the USDA National Organic Program (NOP) does not prohibit the application of pesticides for public health purposes on certified organic farms (see Section 205.672 of Title 7 of the Code of Federal Regulations, Emergency pest or disease treatment, National Organic Program), though any crop or plant part to be harvested that has contact with a prohibited pesticide cannot be sold, labeled, or represented as organic unless otherwise allowed under federal law. Certified organic farms sprayed with pesticides as part of public health purposes do not lose their organic certification for the farm, they lose only the ability to market as organic any crop sprayed by a non-exempt pesticide. This typically applies only to harvests that occur in the same growing season following the pesticide application. Certified organic farms typically represent only a small percentage of land targeted for a possible emergency mosquito control operation, and do not typically include prime mosquito habitat. As such, the SRB will make every effort to exclude these properties from any emergency mosquito control efforts that could impact the certified organic status of their crops.

- Commercial fish hatcheries/aquaculture
  - In early spring of each year, MDAR staff update the list of licensed commercial, state, and federal fish hatcheries/aquaculture facilities, using data from DFG. These entities are contacted by MDAR and asked to update their information. Location data is provided to MDAR via GIS data layer, and this information is included with the map layer of organic farm exclusions.
- Hemp and marijuana farms
  - Any pesticide product to be used for SRB emergency operations should be cross-referenced in the EPA list of products allowed for use on hemp, as there are not currently many products labeled for such use. If the product or active ingredient is not on this list, then hemp farms should be excluded from the SRB operation.

    - Any outdoor marijuana cultivation areas (or greenhouses not fully enclosed) should be excluded, as there are currently no products listed for use on marijuana.
    - In early spring of each year, location data is provided to MDAR by growers and the Cannabis Control Commission Massachusetts (CCC) and then digitized by Hemp Program staff, using MDAR's online mapping tool. This data is then added to the map layer of exclusions.
- Priority habitats for state-listed species
    - Map shapefiles are provided by DFW, and may change depending on the time of year, since they take species life cycles into account.
- Surface drinking water supply resource areas
    - Map shapefiles are provided by DEP.
- Coastal buffers
    - Coastal zones will receive a half mile buffer derived from the NOAA Continually Updated Shoreline Product (CUSP).

For aerial operations, a buffer zone of 1000ft is set from the edge of each of the exclusions described above, to account for spray drift that could occur. This buffer is set according to technical specifications provided by the aerial spray contractor regarding the potential for pesticide drift relative to the plane and spray equipment to be used and is subject to change if the method of pesticide application changes. The GIS Team coordinates the compilation of exclusion areas (no-spray zones) developed by MDAR, DFW, and DEP, and combines this with the determined spray area to produce the final map. The map/GIS map layers are shared with DPH, DEP, and DFW and each agency will then indicate approval to the GIS Team Lead, who will notify the SRB. Further discussions may be held with these agencies as well as MAG, as new mosquito and arbovirus data becomes available and environmental conditions change.

Following consensus between MDAR/SRB, DPH, the appropriate MCDs, and MAG that an emergency mosquito control intervention should occur, MDAR will transfer the final geographic data to the contractors.

In the event that an emergency response is needed, depending on the pesticide selected for application, MDAR may contact the EPA to request a federal exemption to use a pesticide not registered for use over crops.

Exclusion/Inclusion of Priority Habitats

If the area targeted for arbovirus response activities contains Priority Habitat (defined as the known geographical extent of habitat for all state-listed species), the SRB, on behalf of

itself and MDAR, will request that a permit from DFW be issued to the SRB, DPH, and MDAR pursuant to the authority granted in the Massachusetts Endangered Species Act, through the emergency provisions of 321 CMR 10.04(3)(e)) for the Take of state-listed species. DPH, MDAR and DFW may also confer to discuss the feasibility of adjusting the targeted area to work around Priority Habitat, depending on the areas in question, time of year, arbovirus risk levels, potential species impacted, and other factors.

Communication Protocols

MDAR staff will ensure that other agencies are notified of any impending operations, and will also direct staff to notify agricultural stakeholders. MDAR and DPH will provide public notices regarding the locations, dates, and times of aerial spraying or other wide-area emergency operations as required. In the event that emergency mosquito control operations are planned, this SRB web page, and this map page will be kept updated with current information. MDAR will work with DPH through EEA to coordinate press releases as needed.

The SRB Operations Coordinator will also work with MDAR staff to compile the list of entities to be notified of the intended operations.

Please refer to the Notifications/Communications section below for a detailed explanation of the communication protocol.

Monitoring

- **Environmental Monitoring**
  Environmental monitoring in treated areas will be pursued directly following an aerial adulticide application or other emergency arbovirus response to determine whether there are any impacts on the following*:
    - Drinking water supplies and surface waters (DEP, Appendix 9)
    - Apiaries (MDAR, Appendix 10)
    - Potential fish kills (DFW, any observations of potential fish kills should be reported through the Environmental Law Enforcement radio room. 1-800-632-8075, available 24/7)
- **Treatment Efficacy Monitoring**

* Cranberry monitoring was suspended in 2020 after monitoring of aerial sprays using the same pesticide product (Anvil 10+10) in 2010, 2012, and 2019 showed no negative impact.

MDAR/SRB and DPH will initiate plans for standardized monitoring of pre- and post-spray mosquito activity in order to determine the efficacy of the emergency arbovirus response.

If the emergency response is aerial adulticiding, all agencies will follow procedures as outlined in the SRB/Massachusetts Mosquito Control Surveillance Protocol for Evaluation of Efficacy of Aerial Adulticide Application Regarding Mosquito-Borne Disease (Appendix 6).

Staff from other agencies (DEP, DFG, DPH) typically assist MDAR/SRB in GIS mapping and data calculations needed for this monitoring.

NPDES Permitting

Within 30 days of the emergency operation being conducted, if the operation included pesticide application over a body of water, the SRB Operations Coordinator will submit a Notice of Intent (NOI) to the EPA through their Central Data Exchange (CDX) website, in order to satisfy the reporting requirements of the National Pollutant Discharge Elimination System (NPDES).

Notifications/Communications

Chain of Communication

In the event of a mosquito-borne disease emergency, the MDAR Operations Team will reach out to other key MDAR staff, who will assist in notifying entities such as beekeepers, certified organic farms, hemp and marijuana growers, and aquaculture facilities (through the 2022 mosquito season, this is required to be no less than 48 hours in advance of an emergency operation).

MDAR will also reach out to any contractors that could potentially be involved with the operation in order to gauge availability and response time should an operation be warranted.

Interagency Communication

MDAR staff will inform DFG and SRB members representing DCR and DEP, who will report significant findings and concerns to the Commissioner of their respective state agency and/or other designated officials within their respective agency to ensure that important mosquito-borne disease risk information is reported. DEP should also notify the managers of any potentially impacted surface water supplies. The Chair of the SRB will communicate with the MDAR Deputy Commissioners/Chief of Staff, to ensure that EEA is kept informed.

If the emergency arbovirus response encompasses a geographic area that requires several treatments over more than one night, the GIS Team will make every effort to provide the MDAR Operations Team, relevant staff from DPH, and any staff involved in Environmental Monitoring, with a GIS map of the areas that were sprayed by 8am the day following the application, so that this information is readily available once queries from the public, legislators, or other concerned parties begin to come in. A public-facing version of the spray map will also be available here.

Communication of Information to the Public

In the event of a mosquito-borne disease emergency, the MDAR Operations Team will designate a point of contact to work with the EEA Press Office and the DPH Office of Health Communication. Public information will be developed in collaboration with DPH and others in order to communicate timely and accurate information to the public during any mosquito-borne disease threat. The target audiences for these messages will be the media, BOHs, and the public, and the information provided will include the following:

- The type, location, and extent of any incident related to mosquito-borne illness
- Instructions to the public (what to do during an aerial spray, recommendations to practice personal protection to avoid mosquito bites, avoiding areas prone to mosquito activity, etc.)
- The benefits and risks of the planned aerial adulticiding or other emergency operation
- Fact sheets, frequently asked question lists, and contact lists for further information

The SRB Operations Coordinator will work with MDAR staff to compile the list of entities to be notified of the intended operations. This will include entities that operate or reside in the area where the work is to be performed, as well as those who will receive 48-hour notification of the application:

- Aquaculture facilities
- Beekeepers
- Cranberry Growers
- Hemp and marijuana growers
- Individuals who have requested an exclusion under 333 CMR 13.03 (unless a waiver has been issued by MDAR) (see this form)
- Individuals who have requested to be notified (see this form)
- Legislators
- Local and regional boards and commissioners
- Local boards of health
- Municipal officials

- Organic farms

The notice shall be emailed to all of the above entities and also posted on the MDAR website.

In the event that emergency mosquito control operations are planned, this SRB web page, maintained by MDAR, will provide links to relevant information. A current map of the treatment area(s) will also be updated at least once daily during operations.

Notification to Schools/Day Care Centers

The SRB Operations Coordinator will coordinate providing Standard Written Notification for schools, day care centers, and school-age childcare programs, as defined under 333 CMR 14.00. This notification will be posted to the SRB website as well as the MDAR School IPM website, and will be sent to the Massachusetts Department of Elementary and Secondary Education and Massachusetts Department of Early Education and Care. If at least 2 days advance notice is not possible prior to an emergency response, the SRB will also complete an emergency waiver and include it with the notification.

Public Questions/Comments

The primary sources of information for the public when an aerial spray is being planned are the DPH and MDAR websites.

The MDAR aerial spray email (MosquitoProgram@mass.gov) is monitored by MDAR staff during a potential spray event; a hotline is also available at 508-281-6786 and is monitored as staff resources allow. MDAR also maintains a comment form on the spray map website.

Information/File-Sharing

Files that could be useful during an emergency operational response but are typically only updated annually, such as lists of organic farms, beekeeper contacts, and staff contact lists, will each be overseen by the designated staff person listed in this plan. Each staff person should keep current versions of any files they oversee in MS Teams. Staff can request permission to access the correct Teams channel from the SRB Operations Coordinator.

In order to facilitate communication of maps and other information between state staff and contractors, MDAR will reach out to the contractor the week of May 1st each year in order to procure a list of contacts that are expected to be involved in the emergency operations. MDAR will then provide this list to Mass IT so that IT can create temporary state email accounts for each person on the list, and MDAR will add these users to any relevant Teams so that mapping and other relevant information can be quickly and easily shared between the contractors, the GIS Team, and other staff working on Operations.

Scheduled Reporting

During the season that mosquitoes are active (generally April through October), partner agencies and organizations provide regular communications and notifications of conditions related to mosquito activity. These reports are important for communicating arbovirus risk levels and also for understanding both short-term and long-term trends in mosquito activity.

1. DPH Weekly Reporting

The DPH Arbovirus Program generates and distributes weekly Arbovirus Surveillance Program Reports that summarize the results of mosquito trap collections from the prior week and include pertinent mosquito-borne disease risk data. This information is forwarded to key personnel including but not limited to members of the SRB, MCDs, MAG, state Commissioners from DAR, DCR, DEP, and others within EEA. The DPH Arbovirus Program also convenes occasional meetings and conference calls during the mosquito season to provide current status and updates of arbovirus activity, including summaries of isolations or cases in adjoining states.

The weekly reports summarize current data including:

- Reporting of human or animal cases of arbovirus (focused on but not limited to EEEv and WNV)
- Key public communication messages regarding arbovirus risk
- Results of weekly arbovirus testing of mosquito samples sent in by MCDs or collected by DPH
- Current Risk Classifications for EEEv and WNV by municipality (maps)
- Mosquito Surveillance at DPH long-term trap sites (including *Culiseta melanura* abundance levels, with comparison data from previous years, and current and historical data on trends that impact arbovirus infection rates)

DPH also provides up-to-date information about town/city arbovirus risk levels, the number of human and animal arbovirus cases, and the number of mosquitoes (statewide) testing positive for arbovirus, available at this website.

2. SRB/MDAR Reporting

During mosquito season (June-October), the MDAR Environmental Biologist may produce reports that provide supplemental information on current trends of mosquito activity, weather updates, and any other mosquito-related issues of concern. The reports may use information provided by the MCDs, mosquito collection and arbovirus data from current and previous mosquito seasons, weather and climate updates, the DPH-generated Arbovirus Surveillance Program Report, and arbovirus reports from other states. This information will be sent out to the SRB, MCDs, MAG members, staff from MDAR, DCR, DEP, and others within EEA, and key DPH personnel.

The MDAR Operations Team produces an annual report of SRB activities that can be found on the SRB report web page. If there is an emergency operation conducted by the SRB, it will be detailed either in this annual report or in a separate Operation Report on the same web page.

3. MCD reports

The SRB asks each MCD and any municipality performing regular mosquito surveillance/treatment to provide a weekly report to MDAR's Environmental Biologist for use in SRB/MDAR reports and other communications. Several of the MCDs already produce internal weekly reports and some also make these available to the public on their websites. Other MCDs provide MDAR with a weekly email update.

All MCDs, any municipality performing regular mosquito surveillance (including contractors performing this work for a municipality), or anyone doing a mosquito control project outside of an MCD must also file an annual report with the SRB, due by January 31st of the year following when the work was done. These reports are posted online along with the SRB annual reports.

4. MAG/SRB Analysis

MDAR/DPH/MAG meet at a minimum at the beginning and end of the mosquito season each year. If an emerging arbovirus risk appears imminent, additional meetings may occur, and MAG may be asked to evaluate available data sets and recommend strategies for intervention. SRB will take these recommendations under advisement, and may seek further comment and clarification from DPH, the MCDs, and other officials or senior managers within their respective state agencies.

Administration

Fiscal Considerations

The cost of an emergency arbovirus response will be dependent on conditions identified as the mosquito season progresses, including but not limited to the number of acres needing treatment, the kind and amount of chemical necessary to cover the area of risk, need for aerial adulticide application and the calibration and characterization of delivery apparatus of aircraft, environmental monitoring expenses, aircraft software (AGNAV) and Mapping Tech support, post-operations analysis, personnel expenses, and established contingency contracts for aerial application services. Since the SRB does not maintain resources to respond to a large emergency operation, this will be outlined as part of contractor expenses.

Plan Review and Maintenance

MDAR and SRB staff will update this Plan as needed in coordination with the stakeholders listed within the Roles and Responsibilities section of the Plan. Updates may include changes in legislative direction, resources, and processes, as well as updates in standards prior to or as a result of an activation of the Plan.

Conclusion

The overall goal of reducing the transmission risk of mosquito-borne diseases within Massachusetts is ultimately achieved by having an operations plan in place prior to an arbovirus emergency. This includes formalizing contracts covering aerial adulticide application and other emergency operations, pre- and post-treatment monitoring, efficacy testing, securing pesticide vendors, and verifying contact lists for essential personnel. The plan ensures that personnel, products, aircraft, and other supports are available for a rapid and timely response.

This plan ensures that the Commonwealth is ready to provide, as quickly as is feasible, an appropriate and meaningful response based on entomological, epidemiological, meteorological, and ecological data, backed up by both practical and scientific evaluation of this data by the SRB, DPH, MDAR, MAG, and other state agencies including DCR, DEP, and DFG.

Appendix 1: Acronyms

ANF: Massachusetts Executive Office of Administration and Finance

BEH: Bureau of Environmental Health (housed within DPH)

BIDLS: Bureau of Infectious Disease and Laboratory Sciences (housed within DPH)

BMPs: Best Management Practices

BOH: Board of Health (a municipal entity)

C. or CH.: Chapter (in reference to Massachusetts General Law)

CCC: Cannabis Control Commission

CMR: Code of Massachusetts Regulations

CONOPS: Concept of Operations

DCR: Massachusetts Department of Conservation and Recreation

DEP: Massachusetts Department of Environmental Protection

DFG: Massachusetts Department of Fish and Game

DFW: Massachusetts Division of Fisheries and Wildlife (housed within DFG)

DMF: Massachusetts Division of Marine Fisheries (housed within DFG)

DPH (or MDPH): Massachusetts Department of Public Health

EEA or EOEEA: Executive Office of Energy and Environmental Affairs

EEEv (or EEE): Eastern Equine Encephalitis virus

EHHS: Executive Office of Health and Human Services

EPA: Environmental Protection Agency

FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act

GEIR: General Environmental Impact Report, a document outlining mosquito control options along with an assessment of their potential environmental impacts (see https://www.mass.gov/generic-environmental-impact-report-geir), including the original document and any updates

GIS: Geographic Information System, used to map and analyze spatial data

IPM (sometimes IMM): Integrated Pest Management, sometimes specifically "Integrated Mosquito Management"

MAG: Mosquito Advisory Group

MCD: Regional Mosquito Control District/Project

MDAR: Massachusetts Department of Agricultural Resources

M.G.L. (or MGL): Massachusetts General Law (see https://malegislature.gov/laws/generallaws)

MIR: Mean Infection Rate, an estimate of the number of mosquitoes in the environment that are infected with a virus, typically expressed as the number of infected mosquitoes per 1000 mosquitoes. MIR varies over the course of a season and from year to year. An MIR of 2 or less would be considered low, while peak MIR in the 2019 EEEv outbreak ranged from 10 to as high as 15.

MPAL: University of Massachusetts Pesticide Analysis Laboratory

NHESP: Natural Heritage and Endangered Species Program (under DFG/DFW)

NOFA: Northeast Organic Farming Association

NOI: Notice of Intent

NOP: National Organic Program

NPDES: National Pollutant Discharge Elimination System (EPA permit program that regulates the discharge of pollutants from single point sources)

SOP: Standard Operating Procedure

SRB (or SRMCB): State Reclamation and Mosquito Control Board

ULV: Ultra-low Volume (in reference to pesticide application)

USDA: United States Department of Agriculture

WNV: West Nile Virus

Appendix 2: MDAR/SRB Staff Roles and Contact Info

A complete and current contact list of MDAR/SRB staff who have roles related to mosquito control and are likely to be involved in emergency arbovirus response, is available in MS Teams. The SRB Operations Coordinator will update this list each May, before the start of the season. MDAR staff or other state employees who need access to this list should contact the SRB Operations Coordinator.

Appendix 3: Risk Matrices and Response Activities for Mosquito-Borne Illness Prevention and Mosquito Suppression

The tables below show the SRB/MCD response that corresponds to the Phased Responses in the DPH 2022 Massachusetts Arbovirus Surveillance and Response Plan.

Guidelines for Phased Response to EEE Surveillance Data

DPH Risk Category	DPH	SRB/MCDs
1: Remote Must have: • No EEE activity detected in community or focal area in at least 10 years • No current surveillance findings indicating EEE activity in mosquitoes in the focal area • No confirmed animal or human EEE cases in the focal area	• Staff provides educational materials and clinical specimen submission protocols to targeted groups involved in arbovirus surveillance, including, but not limited to, local boards of health, physicians, veterinarians, animal control officers, and stable owners. • Educational efforts directed to the general public on personal prevention steps and source reduction, particularly to those populations at higher risk for severe disease (e.g., children and the elderly). • Passive human and horse surveillance. • Emphasize the need for schools to comply with MA requirements for filing outdoor IPM plans.	**MCDs do the following:** • Perform adult and larval mosquito surveillance • Submit samples to DPH for arbovirus testing. • Carry out management techniques such as source reduction and other control methods, with the goal of reducing levels of immature and adult mosquitoes. • Maintain larvicide applications where necessary, and adulticide applications based on the Mosquito GEIR, surveillance, and other relevant data.
2: Low Must have **EITHER**: • Any EEE activity detected within the last 10 years **OR BOTH of the following:** • Sporadic EEE isolations in *Cs. melanura* in the community or focal area (1-2 isolates found in non-consecutive weeks in a single focal area) • **No** confirmed animal or human cases	**Response as in category 1, plus:** • Expand community outreach and public education programs, particularly among high-risk populations, focused on risk potential and personal protection, emphasizing source reduction. • Public health alert sent out by DPH in response to first EEE virus positive mosquito pool detected during the season. The alert will summarize current surveillance information and emphasize personal prevention strategies	**MCDs should:** • Expand larval control and source reduction where necessary, as surveys or monitoring indicate need. • Maintain current adulticide applications based on Mosquito GEIR, surveillance, and other relevant data.

3: Moderate
Must have **ANY** of the following:
• Within the prior year, sustained EEE activity in bird-biting mosquitoes (mosquito isolates detected for 2 or more consecutive weeks within a single focal area), or an EEE isolate from mammal-biting mosquitoes, or confirmation of one human or animal EEE case with exposure in the community or focal area
• Current sustained EEE activity in *Cs. melanura*, with minimum infection rates above mean levels for focal area trap sites
• Within the current year, a single EEE isolate from mammal-biting mosquitoes (bridge vector species)
• A combination of the following factors (indicative of persistent or increasing risk):
  ○ Enough time remaining in the season for additional amplification of virus
  ○ Weather conditions likely to increase risk (above average temperatures, above average precipitation particularly in the prior fall or spring
  ○ Larger than average *Cs. melanura* and *Cq. perturbans* populations
ALONG WITH:
• No confirmed animal or human EEE cases in current year in that area
	Response as in category 2, plus:
	• Outreach and public health educational efforts are intensified including media alerts as needed.
	• Public health alert may be sent out by MDPH in response to first pool of EEE positive mammal-biting mosquitoes detected during the season. The alert will summarize current surveillance information and emphasize personal prevention strategies.
	• HHAN (Health and Homeland Alert Network) alerts or phone calls are provided to local boards of health upon confirmation of EEE in any specimen; advise health care facilities of increased risk status and corresponding needs to send specimens to DPH for testing.
	• Supplemental mosquito trapping and testing in areas with positive EEE findings, if DPH resources allow. Notify all boards of health of positive findings.
	• In years with evidence of early and escalating activity, especially during outbreak cycles, DPH may begin consulting with MDAR, MCDs, the SRMCB and MAG about the possible need for intensification of mosquito control methods.
		MCDs respond as in cat. 2, plus:
		• Coordinate with DPH to set up and monitor supplemental trapping sites where hotspots of arbovirus activity are thought to occur
		• Targeted larviciding where feasible
		• Adulticiding treatments via ground-based truck-mounted Ultra-Low-Volume (ULV) equipment, dependent on mosquito abundance, time of year, weather conditions, and proximity of arbovirus activity to at-risk populations of people.
		• Outreach to BoH and other municipal officials in the towns/cities within the MCD coverage area
		
		In the event DPH issues a certification that pesticide application is necessary to protect public health, exclusions requests submitted by private property owners and those legally in control of private property pursuant to 333 CMR 13.03 may be waived by MDAR. This will only impact MCD activities if the certification from DPH is not limited to only aerial applications (i.e., also includes ground-based spraying) and the SRB votes to authorize MCDs to waive such exclusions.

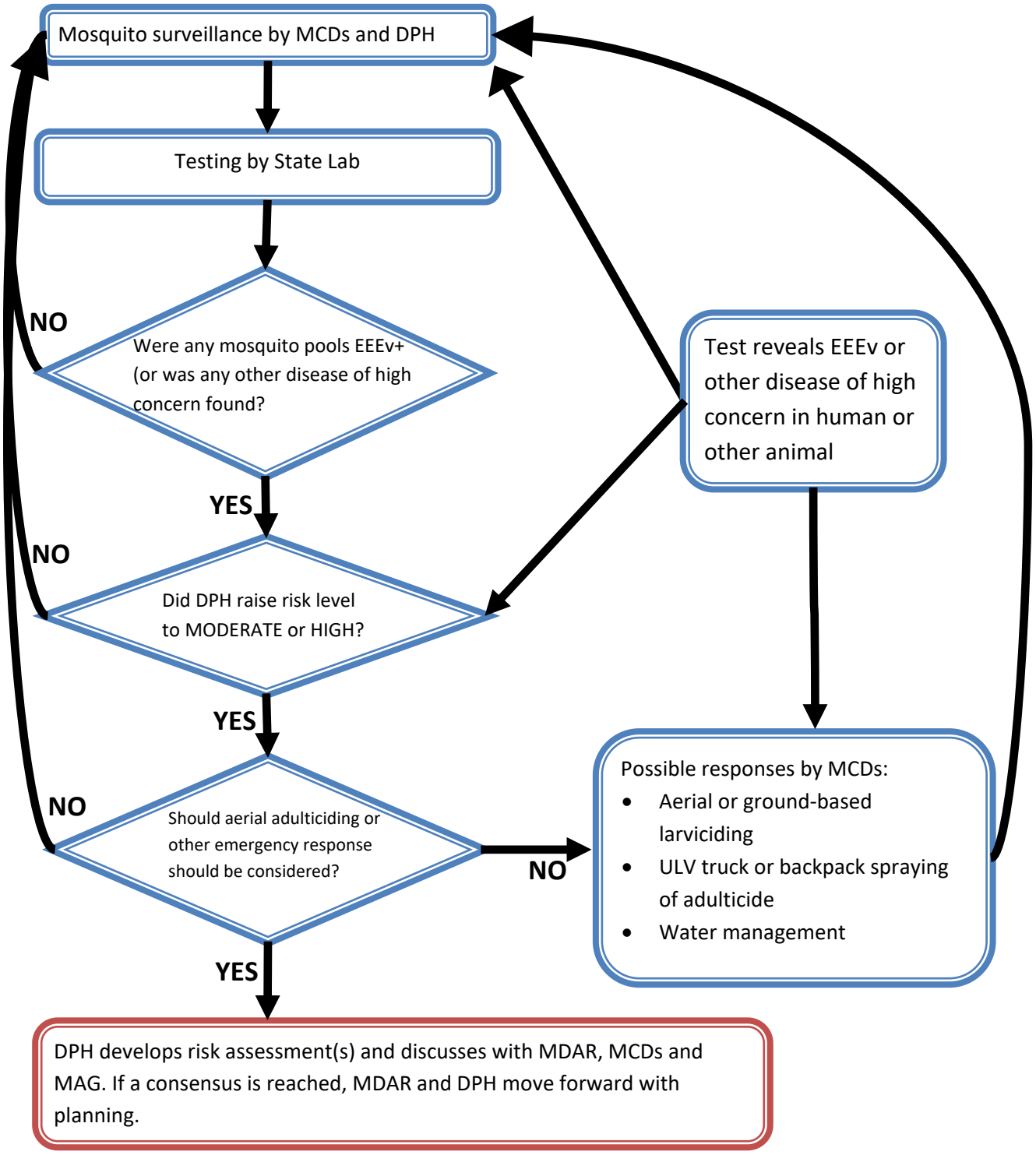
4: High
In the current year, must have **ANY** of the following:
• Sustained or increasing EEE activity in *Cs. melanura* with above average weekly mosquito minimum infection rates
• Two or more EEE isolates in mammal-biting mosquitoes from two different traps
• A single confirmed animal case
 	
And **BOTH** of the following:
• A combination of the following factors indicative of persistent or increasing risk:
  ○ Enough time remaining in the season for additional amplification of virus
  ○ Weather conditions likely to increase risk (above average temperatures, above average precipitation particularly in the prior fall or spring)
  ○ Larger than average populations of *Cs. melanura* and *Cq. perturbans*
• No confirmed human EEE cases prior to late August
	Response as in category 3, plus:
	Intensify public education on personal protection measures (avoid outdoor activity during peak mosquito hours, wear appropriate clothing, use repellents, employ source reduction):
	• Utilize multimedia messages including public health alerts from DPH, press releases from local boards of health, local newspaper articles, cable channel interviews, etc.
	  ○ Encourage local boards of health to actively seek out high-risk populations in their communities (nursing homes, schools, workers employed in outdoor occupations, etc.) and educate them on personal protection
	  ○ Urge towns and schools to consider rescheduling outdoor, evening events in order to avoid the hours between dusk and dawn
	• Active surveillance for human cases is intensified. Health care facilities are advised of increased risk status and corresponding needs to send specimens to DPH for testing
	• Local officials should evaluate all quantitative indicators including population density and time of year and may proceed with their own focal area aerial adulticiding.
	• DPH will confer with local health officials, the SRB, MDAR and impacted MCDs, and MAG to determine if the risk of disease transmission warrants classification as category 5
	• MDPH will confer with local health agencies, SRB and MCDs to discuss the use of intensive mosquito control methods. If elevated risk is assessed in multiple jurisdictions and evidence exists that risk is likely to either increase (based on time of season, weather patterns, etc.) or remain persistently elevated, the interventions may include state-funded aerial application of mosquito adulticide which, if conditions warrant, may be repeated as necessary to interrupt the virus transmission cycle and protect public health.
		MCDs respond as in cat. 3, plus:
		• Expand or intensify response where needed in order to suppress risk (around arbovirus-positive mosquito pools, location of residents near positive findings, and type(s) of wetland habitat where treatment would be most effective).
		• Proceed with focal area larviciding or adulticiding as needed. “Focal area” includes but is not limited to a multiple mile radius circle or larger around positive virus findings, and could incorporate multiple communities, towns or cities.
		
		Discussions should begin regarding the need for aerial adulticiding or other emergency response, if they have not already occurred.
		
		AUTHORIZED MUNICIPAL OFFICIALS:
		• In the event a municipality not in a MCD wants to conduct mosquito control operations, it should contact MDAR to determine whether private property exclusions submitted under 333 CMR 13.03 exist and whether any such certification issued by DPH may result in a waiver of such exclusions by MDAR under its authority. DPH must issue a certification and MDAR must waive the regulatory requirements set forth in 333 CMR 13.03 for private property exclusions to be included in any wide area application of pesticides related to mosquito control.

5: Critical
In the current year, must have either BOTH of the following:
• Multiple measures indicating critical risk of human infection:
  ○ Sustained high mosquito infection rates
  ○ Enough time remaining in the season for additional amplification of virus
  ○ Weather conditions likely to increase risk (above average temperatures, above average precipitation particularly in the prior fall or spring
  ○ Larger than average populations of *Cs. melanura* and *Cq. perturbans*
• A single confirmed EEE human case prior to late August (focal area based on exposure history, not residence)
OR:
• Multiple animal cases clustered in time and space
	Response as in category 4, plus:
	• Continued highly intensified public outreach messages on personal protective measures. Frequent media updates and intensified community level education and outreach efforts. Strong recommendation for rescheduling of outdoor, evening events
	• DPH will confer with local health agencies, SRB and MCDs to discuss the use of intensive mosquito control methods and determine the measures needed to be taken by the agencies to allow for and ensure that the most appropriate mosquito control interventions are applied to reduce risk of human infection. These interventions may include state-funded aerial application of mosquito adulticide. Factors to be considered in making this decision include the seasonal and biological conditions needed to present a continuing high risk of EEE human disease and that those same conditions permit the effective use of an aerially applied pesticide.
	• Once critical human risk has been identified, the SRB will determine the adulticide activities that should be implemented in response to this risk by making recommendations about:
	  • Extent, route and means of treatment
	  • Targeted treatment areas
	• DPH will designate high-risk areas where individual no-spray requests may be preempted by local and state officials based on this risk level. If this becomes necessary, notification will be given to the public
	• DPH strongly recommends restriction of group outdoor activities during peak mosquito activity hours from dusk to dawn, in areas of intensive virus activity
	• DPH will communicate with health care providers in the affected area regarding surveillance findings and encourage prompt sample submission from all clinically suspect cases
		Continue response as in Category 4, and:
		Once critical human risk has been identified, the SRB will consult with MDAR/DPH/MAG to determine the emergency mosquito control response. The SRB should also notify their respective agency officials of any plans. If State Commissioners of MDAR, DEP, DCR agree that aerial adulticide is necessary, the MDAR Commissioner notifies the Secretary of the EEA. The EEA Secretary and HHS/DPH jointly notify the Governor.

Guidelines for Phased Response to Asian Tiger Mosquito (*Aedes albopictus*)

DPH Risk Category	Recommended Response by DPH, SRB and MCDs
1: No identification of *Aedes albopictus* activity in a given area	• DPH, SRB and MCDs identify areas proven to serve as routes of entry for *A. albopictus* (shipping ports, tire recyclers, etc.) • DPH works with MCDs to coordinate surveillance in these areas
2: Isolated or intermittent identification of adult *Aedes albopictus* in a given area, likely to represent introduction or repeated reintroductions	• Continue or expand surveillance • Submit any adult mosquitoes to DPH for storage and possible testing, as the situation warrants • Work with BOHs to identify possible habitat/potential breeding sites; initiate clean-up as necessary
3: Consistent findings of adult *Aedes albopictus*, or evidence of possible overwintering	• Expand surveillance to detect extent of geographic distribution • Submit any adult mosquitoes to DPH for storage and possible testing, as the situation warrants • Work with BOHs to identify possible habitat/potential breeding sites; initiate clean-up as needed • Direct educational efforts to the general public, covering personal prevention steps and source reduction • DPH consults with MCDs, SRB, and MAG to assess and evaluate the need for larviciding or adulticiding interventions

Appendix 4: Emergency Operations Decision Process



Appendix 5: Mosquito Advisory Group (MAG) Members

The Mosquito and Advisory Group (MAG) is comprised of a minimum of four independent experts.

Current MAG members:

Dr. Richard Pollack, MAG Chairman
Public Health Entomologist
Senior Environmental Public Health Officer, Harvard University
Instructor, Harvard School of Public Health
President & Chief Scientific Officer, IdentifyUS LLC

Dr. Asim Ahmed (specializing in Pediatric Infectious Disease)
Division of Infectious Diseases, Children's Hospital Boston
Harvard Medical School

Dr. Anthony (Tony) Kiszewski, Epidemiologist
Department of Natural and Applied Sciences, Bentley College

Dr. Sam Telford, Epidemiologist (focusing on the public health burden of vector borne infections)
Professor, Tufts University, Dept of Infectious Disease and Global Health
Cummings School of Veterinary Medicine, Tufts University

Appendix 6: SRB Protocol for Evaluating the Efficacy of Aerial Adulticide Application(s) or other Emergency Arbovirus Response

Introduction

Eastern Equine Encephalitis (EEEv) and West Nile Virus (WNV) are the most significant mosquito-borne public health threats in Massachusetts. In Massachusetts and elsewhere in the United States, organized regional mosquito control and surveillance programs operate using the principles of Integrated Pest Management (IPM) where action thresholds and intervention decisions are based on surveillance.

Mosquito-borne disease surveillance informs the local epidemiology of the disease. Factors include presence, distribution, and prevalence of the causal agents and vectors. Surveillance of mosquito populations, short and long-term environmental factors, seasonal variations, and weather, together facilitate the process of assessing risk of mosquito-borne disease, and provide a basis for intervention decisions.

In Massachusetts, surveillance is performed by the mosquito control districts/projects (MCDs) and the Massachusetts Department of Public Health (DPH). This surveillance includes monitoring of ecological and epidemiological parameters. DPH also assigns risk levels pertaining to EEEv and WNV transmission throughout the mosquito season.

The primary method for determining the efficacy of emergency mosquito control treatment is to compare abundance of targeted mosquito species before and after the emergency treatment intervention. DPH, in partnership with the MCDs, initiates plans for evaluation of pre- and post-spray mosquito activity as part of the emergency mosquito response plan. MDAR may assist DPH as needed with GIS mapping and data calculations.

Purpose

This appendix establishes a standardized spray efficacy protocol to evaluate emergency aerial adult mosquito control intervention for use by the Board, its MCDs and DPH. The purpose of this protocol is to provide guidance on how to quantitatively document the impact of aerially applied adulticide on mosquito populations. The goal of an intervention is to reduce the risk to humans of contracting a mosquito-borne disease.

Although the protocol places emphasis on EEEv, there are also established surveillance systems for WNV and for the invasive Asian tiger mosquito (ATM). Each system uses a specific mosquito

trap designed to target the appropriate mosquitoes, with the WNV surveillance system employing gravid traps and the ATM surveillance system using ovitraps and BG Sentinel traps. Gravid traps collect live *Culex* spp. adults (the primary vectors of WNV) for virus analysis, and could be used to quantitatively measure the efficacy of WNV interventions. The ovitraps and Sentinel traps collect eggs and adults, respectively, and are used to gauge regional presence of ATM, though specimens may be collected and stored for arbovirus analysis later.

Mosquito Species

Of current concern to public health authorities and mosquito control professionals in Massachusetts are:

- For EEEv: *Culiseta melanura* (primary vector), and the bridge vectors *Coquillettidia perturbans*, *Aedes vexans,* and *Ochlerotatus canadensis*
- For WNV: *Culex pipiens* (primary vector)

Quantitative Measurement for Efficacy of Emergency Mosquito Control Intervention

Traps used for assessing the efficacy of emergency mosquito control intervention are selected and deployed to maximize the sampling of mosquitoes of the target species and their flight range. The larger the sample size, and the greater the proportion of the sample being composed of the target species, the greater the return on investment of time and labor. The evaluation of efficacy of an intervention can be measured in three ways:

1. **Document changes in mosquito abundance**

   This is done by comparing populations before and after an application. Decreases in mosquito abundance support a conclusion that the intervention was successful, since the likelihood of humans acquiring bites by disease carrying mosquitoes has been reduced. This analysis takes into consideration changes in mosquito abundance (pre- and post-application) in non-treated areas. The number of mosquitoes collected in a trap can vary significantly for a variety of reasons, including emergence of new adults, weather conditions, immigration of mosquitoes from outside the treated area, etc., and in some cases may even rise after a spray event. Comparison of untreated areas with treated areas helps to account for these factors.

2. **Document changes in the infection rate of the mosquito population**

   Efficacy can also be measured by calculating changes in the minimum infection rate (MIR), an estimate of the number of mosquitoes in the environment that are infected with a virus. MIR is calculated from the number of mosquitoes tested and the number of positive pools ((# of positive pools/total # tested)*1000 = MIR), and is usually expressed as the number of

infected mosquitoes per 1000 mosquitoes. An effective intervention should be expected to reduce MIR. However, it is important not to make conclusions based solely upon this calculation, since an increase in the MIR post-treatment may imply a lack of effectiveness of treatment but could also mean that the treatment impacted mainly young mosquitoes that had not yet had an opportunity to acquire arbovirus. When feasible, gauging information relating to the age structure of the mosquito populations may be beneficial as part of the analysis of an arbovirus response.

3. Document changes in the age structure of the population (older mosquitoes are more likely to carry disease)

Mosquitoes infected with WNV or EEEv have blood fed at least once, and in most cases this also means that they have laid eggs. The development of eggs causes changes in the ovarian tracheoles that can be seen through dissection, allowing entomologists to effectively determine the age of the mosquitoes collected. After a successful treatment, the age of mosquitoes collected should decrease, as collections should mainly consist of newly emerged individuals (this can be species-specific, so caution should be taken in performing such an assessment without breaking the data down by species). This assessment technique is extremely resource intensive, and potentially decreases the number of mosquitoes that can be tested for disease, so has not typically been employed in Massachusetts.

Emergency Aerial Adult Mosquito Control Efficacy Protocol

DPH, in conjunction with MCDs, will conduct pre- and post- treatment mosquito surveillance using CO_2-baited portable light traps or other traps as agreed upon by the SRB in consultation with DPH and MAG. Once the collections are counted, the number of mosquitoes in each group for each species must be recorded, entered into a database for graphical presentation, or plotted manually so that changes in mosquito abundance can be readily examined and verified. Maps and GPS coordinates for trap locations within and outside the designated treatment polygon/zone will be developed and shared between all agencies involved in the testing. The Henderson-Tilton formula is typically used for calculations of efficacy, unless a different method is approved by DPH, MDAR, and the SRB (online calculation is available at http://www.ehabsoft.com/ldpline/onlinecontrol.htm). DPH will analyze and evaluate the intervention treatment, calculate the extent of population change attributable to the intervention (expressed as a percent reduction), and provide a written report to MDAR and the SRB within 21 days of the emergency operation.

Appendix 7: Vendor Information for Aerial Application or Other Emergency Response

As described in the Request for Response for Aerial and/or Ground Application of Insecticides for Mosquito Control (Emergency and Area-Wide Vector Control Services), vendor(s) must have the capacity to meet the needs of any recommended aerial intervention, including smaller, targeted, acreages and larger, wide-area treatments, both larviciding and adulticiding, and/or be able to provide assistance for other emergency response operations, including ground-level treatments to combat new species such as Asian tiger mosquito. The Request for Proposals that covers this work is on a rolling timeline, meaning that qualified vendors can be added at any time. MDAR, on behalf of the SRB, will periodically review the RFP and determine whether there are new vendors that could apply, particularly vendors that may offer helicopter adulticiding services.

The SRB currently has five approved vendors on state contract for aerial adulticiding or other emergency response services. The contracts cover the following:

- Limited wide-area aerial larviciding, by helicopter or rotary-wing aircraft, using an SRB-approved pesticide (currently one using the active ingredient Bti, such as Vectobac G), with a 72-hour response time.
- Limited or small-block wide-area adulticiding, using small, GPS-equipped, twin-engine, fixed-wing aircraft, using an SRB-approved pesticide (currently one using the active ingredient d-Phenothrin (sumithrin), such as Anvil 10+10), 500-25,000 acres, 72-hour response time.
- Larger-scale wide-area adulticiding, using multi-engine, GPS-equipped, turbine powered, fixed-wing aircraft, using an SRB-approved pesticide (currently one using the active ingredient d-Phenothrin (sumithrin), such as Anvil 10+10), 25,000-500,000 or more acres, 72-hour response time.
- Truck-based ultra-low volume (ULV) adult mosquito control application services, to be used specifically in response to a mosquito-borne disease outbreak, as a complement to aerial and local MCD abatement efforts

Contact of the vendor by SRB for an aerial or truck-based adulticiding event triggers deployment and mobilization of aircraft or trucks (assessment of number of aircraft and trucks required, when they will arrive, and when operations will start and finish). Aerial and truck-based adulticiding may take one or more evenings depending on the following:

- Weather conditions (high wind, low temperatures, or deteriorating weather conditions may delay treatment)
- Number of acres or mileage needing treatment
- Shape of treatment area (small or scattered blocks created by exclusions will extend treatment time needed)
- Number of aircraft or trucks available/needed
- Availability of an approved multi-hour spray or truck-based window to treat large spray blocks (a minimum 6-hour window, from sunset to shortly after sunrise)

Aerial larviciding is typically done near dawn or dusk but may be done at other times of day depending on weather conditions and method of application. The optimum window for adulticiding depends upon the target species of mosquito and the hours during which that species is most active. However, a typical spray window would begin approximately at sunset and conclude after midnight, targeting adult mosquitoes in flight. The fewer blocks or zones that need to be excluded as “no spray,” the more operational efficiency can be expected.

Appendix 8: Pesticide Reviewed and Selected for Potential Use in Aerial Spray Adulticiding: 2024

Based on input from representatives from MDAR, DEP, DFG, and DPH, the SRB selected **Anvil 10+10 ULV** for use if an aerial adulticide application was determined to be necessary, with **Merus 3.0** selected as a backup product. For background on the selection process, please see "Pesticide Use Approval" (p. 16). Current labels for each product are provided below.

clarke

ANVIL® 10+10 ULV

Contains an Oil Soluble Synergized Synthetic Pyrethroid for Control of Adult Mosquitoes (Including Organophosphate-Resistant Species) Midges, and Black Flies in Outdoor Residential and Recreational Areas.

ACTIVE INGREDIENTS:	
3-Phenoxybenzyl-(1RS, 3RS; 1RS, 3SR)-2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropanecarboxylate	10.00%
*Piperonyl Butoxide	10.00%
**OTHER INGREDIENTS	80.00%
	100.00%

Contains 0.74 lbs. Technical SUMITHRIN®/Gallon and 0.74 lbs. PBO/Gallon

*(butylcarbityl)(6-propylpiperonyl) ether and related compounds

**Contains petroleum distillate

KEEP OUT OF REACH OF CHILDREN

CAUTION

PRECAUCION AL USUARIO: Si usted no lee ingles, no use este producto hasta que la etiqueta haya sido explicado ampliamente

FIRST AID	
IF SWALLOWED:	• Immediately call a poison control center or doctor. • Do not induce vomiting unless told to do so by a poison control center or a doctor. • Do not give any liquid to the person. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.

NOTE TO PHYSICIAN

Contains petroleum distillate - vomiting may cause aspiration pneumonia.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For information regarding medical emergencies or pesticide incidents, call 1-888-740-8712.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION. Harmful if absorbed through the skin. Avoid contact with skin, eyes and clothing. In case of contact, flush with plenty of water. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemical-resistant to this product are: barrier laminate, nitrile rubber, neoprene rubber or Viton. Mixers, loaders, applicators, and other handlers must wear long-sleeved shirt, long pants, shoes and socks. In addition, all handlers except for applicators using motorized ground equipment, pilots, and flaggers, must wear chemical-resistant gloves. See engineering controls for additional requirements.

USER SAFETY REQUIREMENTS

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent material that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them.

USER SAFETY RECOMMENDATIONS

Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. User should remove clothing/PPE immediately if pesticide gets inside, then wash thoroughly and put on clean clothing. User should remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

ENGINEERING CONTROLS

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)]. Human flagging is prohibited. Flagging to support aerial applications is limited to use of the Global Positioning System (GPS) or mechanical flaggers.

ENVIRONMENTAL HAZARDS

This product is toxic to aquatic organisms, including fish and invertebrates. Runoff from treated areas or deposition of spray droplets into a body of water may be hazardous to fish and aquatic invertebrates. Before making the first application in a season, it is advisable to consult with the state or tribal agency with primary responsibility for pesticide regulation to determine if other regulatory requirements exist. Do not apply over bodies of water (lakes, rivers, permanent streams, natural ponds, commercial fishing 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. Do not contaminate bodies of water when disposing of equipment rinsate or wash waters.

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the 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.

PHYSICAL OR CHEMICAL HAZARDS

Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS:

For use by federal, state, tribal, or local government officials responsible for public health or vector control, or by persons certified in the appropriate category or otherwise authorized by the state or tribal lead pesticide regulatory agency to perform adult mosquito control applications, or by persons under their direct supervision.

IN CALIFORNIA: This product is to be applied by County Health Department, State Department of Health Services, Mosquito and Vector Control or Mosquito Abatement District personnel only.

IN FLORIDA: Aerial applications of this product require trained personnel to perform industry accepted assays to monitor resistance formation in targeted mosquitoes.

Do not treat a site with more than 0.0036 lbs of Sumithrin® or 0.0036 lbs of PBO per acre in a 24-hour period. Do not exceed 0.1 lb of Sumithrin® or PBO per acre in any site in any year. More frequent applications may be 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.

NOTE: When rotating products with other insecticides containing PBO, do not exceed 2 lbs PBO per acre per year.

Not for use in outdoor residential misting systems.

USE INFORMATION

ANVIL 10+10 ULV is approved for application as a thermal aerosol and an Ultra Low Volume (ULV) nonthermal aerosol (cold fog) in mosquito adulticiding programs involving outdoor residential and recreational areas where adult mosquitoes are present in annoying numbers in vegetation surrounding parks, woodlands, swamps, marshes, overgrown areas and golf courses. ANVIL 10+10 ULV may be applied over agricultural areas for the control of adult mosquitoes within or adjacent to the treatment areas.

For best results, apply when mosquitoes are most active and weather conditions are conducive

AL0398

SAMPLE LABEL

to keeping the fog close to the ground. Application in calm air conditions is to be avoided. Apply only when wind speed is greater than or equal to 1 mph. All types of applications should be conducted at temperatures above 50 °F.

NOTE: ANVIL 10+10 ULV cannot be diluted in water. Dilute this product with light mineral oil if dilution is preferred.

SPRAY DROPLET SIZE DETERMINATION

Ground-based, wide area mosquito abatement application: Spray equipment must be adjusted so that the volume median diameter is less than 30 microns (Dv 0.5 < 30 µm) and that 90% of the spray is contained in droplets smaller than 50 microns (Dv 0.9 < 50 µm). Directions from the equipment manufacturer or vendor, pesticide registrant, or a test facility using a laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

Aerial Equipment, wide area mosquito abatement application: Spray equipment must be adjusted so that the volume median diameter produced is less than 60 microns (Dv 0.5 < 60 µm) and that 90% of the spray is contained in droplets smaller than 80 microns (Dv 0.9 < 80 µm). The effects of flight speed and, for non-rotary nozzles, nozzle angle on the droplet size spectrum must be considered. Directions from the equipment manufacturer or vendor, pesticide registrant, or a test facility using a wind tunnel and laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

GROUND ULV APPLICATION

Apply ANVIL 10+10 ULV through a standard ULV cold aerosol or non-thermal aerosol (cold fog) generator. Consult the following table for examples of various dosage rates using a swath width of 300 feet for acreage calculations. Vary flow rate according to vegetation density and mosquito population. Use higher flow rate in heavy vegetation or when populations are high.

Dosage Rate of each a.i. (Lbs. Sumithrin® and PBO per acre)	Fl.oz. ANVIL 10+10 ULV per Acre	Flow Rates in fluid oz./minute at truck speeds of:			
		5 MPH	10 MPH	15 MPH	20 MPH
0.0036	0.62	1.9	3.8	5.7	7.6
0.0024	0.42	1.3	2.5	3.8	5.1
0.0012	0.21	0.6	1.3	1.9	2.5

ANVIL 10+10 ULV may also be applied with non-thermal, portable, motorized backpack equipment adjusted to deliver ULV particles of less than 100 microns VMD. Use 0.21 to 0.62 fl. oz. of the undiluted spray per acre (equal to 0.0012 to 0.0036 lb. a.i./acre) as a 50 ft. (15.2 m) swath while walking at a speed of 2 mph (3.2 kph). Dilute with a suitable mineral oil if dilution is preferred. Do not exceed 0.62 fl. oz. of the undiluted spray per acre. Do NOT use portable backpack equipment for application in enclosed spaces.

ANVIL 10+10 ULV may be applied through truck mounted thermal fogging equipment. Do not exceed the maximum rates listed above. May be applied at speeds of 5 to 20 mph. To reduce oil requirement and sludge buildup in equipment, use a 60 - 100-second viscosity mineral "fog" oil, or other fuel-type oil. Use a clean, well-maintained and properly calibrated fogger. Do not wet foliage since oil base formulations may be phytotoxic. For use with hand carried foggers, use same rates of active ingredient per acre and a swath width of 50 ft with a walking speed of 2 mph. Fog downwind, with the wind at your back. Do NOT use hand-carried foggers for application in enclosed spaces.

AERIAL APPLICATION

ANVIL 10+10 ULV may be applied at rates of 0.21 to 0.62 fluid ounces ANVIL 10+10 ULV per acre by fixed wing or rotary aircraft equipped with suitable ULV application equipment. ANVIL 10+10 ULV may also be diluted with a suitable solvent such as mineral oil and applied by aerial ULV equipment so long as 0.62 fluid ounces per acre of ANVIL 10+10 ULV is not exceeded. Do not apply by fixed wing aircraft at a height less than 100 feet above the ground or canopy, or by helicopter at a height less than 75 feet above the ground or canopy unless specifically approved by the state or tribe based on public health needs.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store in a cool, dry place. Keep container closed.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with mineral oil and recap. Shake for 10 seconds. Pour rinsate into application equipment or a rinse tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

CONTAINER HANDLING: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into rinsate collection system. Repeat this rinsing procedure two more times. Offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

NOTICE: To the extent provided by law, seller makes no warranty, expressed or implied, concerning the use of this product other than as indicated on the label. Buyer assumes all risk of use and/or handling of this material when use and/or handling is contrary to label instructions.

ANVIL™ is a Trademark of Clarke Mosquito Control Products, Inc.
Sumithrin ® is a Trademark of Sumitomo Chemical Co, Ltd.

Manufactured For
CLARKE MOSQUITO CONTROL PRODUCTS, INC.
159 N. GARDEN AVENUE
ROSELLE, ILLINOIS 60172 U.S.A
FOR MORE INFORMATION CALL: 1-800-323-5727

EPA Reg. No.: 1021-1688-8329
EPA Est. No: 8329-IL-01
NET CONTENTS: [ ] 2.5 GAL [ ] 30 GAL [ ] 55 GAL [ ] 275 GAL
LOT NO.:
AL0398

MERUS® 3.0

FOR USE IN ORGANIC PRODUCTION

For control of adult mosquitoes in Outdoor Residential, Recreational, Urban, Industrial, and Agricultural Areas. For use over agricultural crops, including those intended for human consumption, pasture, and rangeland. For Aerial and Ground ULV Application.

Active Ingredient:	
Pyrethrins, a botanical insecticide	5.0%
Other Ingredients	95.0%
	100.0%

Contains 0.365 pounds Pyrethrins per gallon

KEEP OUT OF REACH OF CHILDREN

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Personal Protective Equipment (PPE): Mixers, loaders, applicators and other handlers must wear the following: long-sleeve shirt, long pants, shoes and socks. See engineering controls for additional requirements.

User Safety Requirements: Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them.

User Safety Recommendations: Users should wash hands before eating, drinking, chewing gum, tobacco, or using the toilet. Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

Engineering Controls: Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)]. Human flagging is prohibited. Flagging to support aerial application is limited to use of the Global Positioning System (GPS) or mechanical flaggers.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to aquatic organisms, including fish and aquatic invertebrates. Runoff from treated areas or deposition of spray droplets into a body of water may be hazardous to fish and aquatic invertebrates. Before making the first application in a season, it is advisable to consult with the state or tribal agency with primary responsibility for pesticide regulation to determine if other regulatory requirements exist. Do not apply 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. Do not contaminate bodies of water when disposing of equipment rinsate or washwaters.

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are foraging 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.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

This product is not for use in outdoor residential misting systems. Do not apply this product with thermal fogging equipment. Do not apply this product in enclosed spaces using hand-held or portable backpack spray equipment. Do not make applications during rain.

For use only by federal, state, tribal or local government officials responsible for public health or vector control, or by persons certified in the appropriate category or otherwise authorized by the state or tribal lead pesticide regulatory agency to perform adult mosquito control applications, or by persons under their direct supervision.

IN CALIFORNIA: This product is to be applied by County Health Department, State Department of Health Services, Mosquito and Vector Control or Mosquito Abatement District personnel, or persons under contract to these entities only.

IN FLORIDA: Aerial applications of this product require trained personnel to perform industry accepted assays to monitor resistance formation in targeted mosquitoes.

The maximum application rate for wide-area mosquito adulticide applications is 0.0025 lb a.i./acre per day. When targeting *Aedes taeniorhynchus* and other difficult species, applications may be made up to 0.008 lb a.i./acre/day.

Do not apply more than 0.2 lb a.i./acre/year in any treated area. More frequent treatments may be 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.

SPRAY DRIFT MANAGEMENT for WIDE AREA MOSQUITO ABATEMENT

A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, relative humidity) and method of application (e.g., ground, aerial, airblast, chemigation) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product.

WIND SPEED: Apply only when wind speed is greater than 1 mph.

USE INFORMATION

MERUS® 3.0 is approved for application as an Ultra Low Volume (ULV) non-thermal aerosol (cold fog) in mosquito adulticiding programs involving outdoor residential, urban, industrial, and recreational areas where adult mosquitoes are present in annoying numbers, and in vegetation surrounding parks, woodlands, swamps, marshes, overgrown areas and golf courses.

MERUS® 3.0 may be applied over crops or to areas favoring drift over crops, including row, tree, fruit, citrus, pasture and other areas where agricultural enterprises take place.

MERUS® 3.0 may be used undiluted or diluted with suitable light mineral oil and applied as an ultra low volume (ULV) non-thermal aerosol (cold fog) or in suitable mechanical spray equipment. MERUS® 3.0 cannot be diluted in water.

SPRAY DROPLET SIZE DETERMINATION

Ground-based wide-area mosquito abatement application: Spray equipment must be adjusted so that the volume median diameter is less than 30 microns (Dv 0.5 < 30 µm) and that 90% of the spray is contained in droplets smaller than 50 microns (Dv 0.9 < 50 µm). Directions from the equipment manufacturer or vendor, pesticide registrant, or a test facility using a laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

AL0594

SUBMITTED IN LABEL

Aerial wide-area mosquito abatement application: Spray equipment must be adjusted so that the volume median diameter produced is less than 60 microns (Dv 0.5 < 60 µm) and that 90% of the spray is contained in droplets smaller than 80 microns (Dv 0.9 < 80 µm). The effects of flight speed, and for non-rotary nozzles, nozzle angle on the droplet size spectrum must be considered. Directions from the equipment manufacturer or vendor, pesticide registrant, or a test facility using a wind tunnel and laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

GROUND ULV APPLICATION

To control Mosquitoes, apply MERUS® 3.0 at a flow rate of 3.4 to 5.3 fluid ounces per minute at an average vehicle speed of 10 MPH using a swath width of 300 feet for acreage calculations (see chart below). These rates are equivalent to 0.0016 to 0.0025 lb a.i./acre. Within this range, vary flow rate according to vegetation density and mosquito population. Use higher rate in heavy vegetation or when pest population numbers are high. For best results, apply when mosquitoes are most active and meteorological conditions are conducive to keeping the spray cloud close to the ground. Application in calm air conditions is to be avoided. Apply only when ground wind speed is greater than or equal to 1 MPH. All types of applications should be conducted at temperatures above 50°F.

Use the following table to calculate application rates:

lb a.i./acre	Application Rates (Fl.oz./Minute) at vehicle speeds of:				Fl. oz. MERUS® 3.0/acre
	5 MPH	10 MPH	15 MPH	20 MPH	
0.0025	2.7	5.3	8.0	10.6	0.88
0.0021	2.2	4.5	6.7	8.9	0.74
0.0018	1.9	3.8	5.7	7.7	0.63
0.0016	1.7	3.4	5.1	6.8	0.56

Applications up to 2.81 fl.oz. (0.008 lb a.i.)/acre may be made when targeting *Aedes taeniorhynchus* or other difficult to control species.

lb a.i./acre	Application Rates (Fl.oz./Minute) at vehicle speeds of:				Fl. oz. MERUS® 3.0/acre
	5 MPH	10 MPH	15 MPH	20 MPH	
0.008	8.5	17.0	25.5	34.0	2.81

If dilution is preferred, adjust the flow rate accordingly to achieve 0.0016 to 0.0025 lb a.i./acre. Applicable flow rates for a 1 part concentrate to 1 part oil dilution are presented. If an alternate dilution rate is used, adjust the flow rate accordingly.

Rates to use a 2.5% pyrethrins dilution (1 to 1 dilution ratio) for mosquito control:

lb a.i./acre	Application Rates (Fl.oz./Minute) at vehicle speeds of:				Fl. oz. Finished Spray/ acre
	5 MPH	10 MPH	15 MPH	20 MPH	
0.0025	5.3	10.6	15.9	21.3	1.75
0.0021	4.5	8.9	13.4	17.9	1.47
0.0018	3.8	7.7	11.5	15.3	1.26
0.0016	3.4	6.8	10.2	13.6	1.12

Urban ULV Mosquito Control: MERUS® 3.0 may be applied for control of resting or flying adult mosquitoes in urban and industrial areas such as utility tunnels, pipe chases, underground basements, underground passages, parking decks, open parking garages, abandoned warehouses, crawl spaces, uninhabited buildings, rail yards, waste yards, junkyards, tire dumps, and other areas where adult mosquitoes might be found. Apply using handheld or truck-mounted ULV equipment, or other spray equipment suitable for this application. Apply at rates up to but not exceeding 0.0025 lb a.i./acre/day (0.88 fluid ounces of undiluted spray/acre/day). Do NOT use hand-held equipment for this type of application in enclosed spaces.

MERUS® 3.0 may also be applied with non-thermal, portable, motorized backpack equipment adjusted to deliver ULV particles of less than 100 microns VMD. Use 0.56 to 0.88 fl.oz. of the undiluted spray per acre (equal to 0.0016 to 0.0025 lb.ai./acre) as a 50 ft (15.2 m) swath while walking at a speed of 2 MPH (3.2 KPH). Dilute with a suitable mineral oil if dilution is preferred. Do NOT use portable backpack equipment for application in enclosed spaces.

AERIAL APPLICATION

Apply using nozzle height of no less than 100 feet for fixed wing aircraft or 75 feet for rotary wing aircraft above the ground or canopy, unless specifically approved by the state or tribe based on public health needs.

Apply by suitable fixed wing or rotary aircraft equipped with nozzles capable of producing a non-thermal (cold fog) aerosol spray cloud with appropriately sized droplets. Flow rate and swath width should be set so as to achieve 0.56 to 0.88 fluid ounces of undiluted MERUS® 3.0 per acre.

MERUS® 3.0 may also be diluted with suitable diluent light mineral oil and applied by suitable aircraft at appropriate flow rates to achieve a dosage of 0.0016 to 0.0025 lb a.i./acre. Diluted or undiluted, applications up to 2.81 fl.oz. MERUS® 3.0 (0.008 lb a.i.)/acre/day may be made when targeting *Aedes taeniorhynchus* or other difficult to control species.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store in a cool, dry place. Keep container closed.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

For Nonrefillable containers of 5 gallons or less. Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with mineral oil and recap. Shake for 10 seconds. Pour rinsate into application equipment or a rinse tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

For Refillable Containers. Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into rinsate collection system. Repeat this rinsing procedure two more times. Offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. **For medical emergencies or information on health concerns for this product, you may call 1-800-214-7753.** For non-emergency information, on product usage for example, call 1-800-323-5727. In case of transportation emergency, call INFO-TRAC 1-800-553-5053.

NOTICE: To the extent consistent with applicable law, Clarke Mosquito Control Products, Inc. makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that extend beyond the statements made on this label. To the extent consistent with applicable law, Buyer assumes all risk of use/handling of this material when use and/or handling is contrary to label instructions.

MERUS®-Trademark of Clarke Mosquito Control Products, Inc.

MANUFACTURED BY
CLARKE MOSQUITO CONTROL PRODUCTS, INC.
159 N. GARDEN AVENUE
ROSELLE, ILLINOIS 60172

EPA Reg. No.:8329-108 EPA Est. No.:_____

Lot No.: Marked on Container Label

Available Container Sizes: 2.5 gal, 30 gal, 55 gal, 275 gal

AL0594

SAMPLE LABEL

Appendix 9: Surface Water Supply Monitoring Plan to Assess Potential Impact of Mosquito Control Spraying During a Public Health Emergency

In the event that the Commissioner of Public Health issues a determination of an elevated risk of arbovirus and/or the certification of public health hazard that requires pesticide application to protect public health, the area(s) identified for coordinated mosquito control efforts will be sampled to assess potential impact to drinking water suppliers with surface water supplies.

For the most up-to-date information on this topic from DEP, please see:

- Drinking Water Information for Boards of Health
- Detailed information about protecting drinking water supplies: Surface Water Supplies
- Drinking Water Contaminants Information for Water Suppliers: Sumithrin

Appendix 10: Honey Bee Monitoring Protocol for Aerial Mosquito Adulticide Application

Honey bees and other similar pollinators generally forage during daylight hours when temperatures are above 55-60°F. Because of this, insecticides applied during the day near pollen- or nectar-producing plants, at temperatures optimal for pollinator activity, could inadvertently impact pollinator populations. Treatments made to areas during the night or very early morning pose the least risk for these pollinators. However, large population sizes, temperatures above 85°F, and beekeeper-applied miticides may cause honey bees to congregate on the outside of hive boxes at night ("bee bearding"), potentially increasing the likelihood of some limited exposure to honey bees in spray areas.

Mosquito Adulticide Applications and Honey bees

Mosquito adulticiding that occurs between dusk and dawn has a low anticipated risk to honey bees, due to the inactivity of the insects and the short half-life of Sumithrin. Regardless, MDAR will carry out the following protocol as a part of any SRB-authorized aerial mosquito adulticide operation:

- Beekeepers will be notified through the MDAR website, emails, and on social media through the MDAR Twitter feed (@MassDeptAgr) and Facebook page.
- MDAR's Chief Apiary Inspector will oversee the monitoring of selected beehives, in order to evaluate hive health both before and after application of an aerial adulticide.
- Approximately 3-5 apiaries will be selected within a 5-mile radius of the spray area (treatment group), and 3-5 apiaries at a distance greater than 5 miles from the outer limits of the spray area (control group). County beekeeping associations and beekeepers recently inspected by the MDAR Apiary Program will be contacted to solicit participation from apiary owners.
- Prior to an aerial spray, apiaries will be monitored via health inspections of honey bee colonies as close to the timing of the spray event as possible. If time does not permit, MDAR may rely on data from inspections made earlier in the season. Inspections typically include an evaluation of the queen, worker population, brood, colony development, food stores and equipment conditions. If deemed necessary, samples may also be taken during these inspections in order to test for the presence of pesticides, pests, parasites, and pathogens.
- Once the aerial spray has occurred, these same apiaries will receive health inspections of honey bee colonies during two time periods (1-3 days post-spray, and then again at 7-10 days post-spray) to evaluate both acute and delayed impacts on colonies. These inspections will be conducted in the same manner as the pre-spray inspections. Samples will be collected as necessary to evaluate potential health issues.
- Beekeepers will also be contacted in the months following aerial adulticiding, to follow up on honey bee health and evaluate colonies for any potential delayed impacts.
- MDAR will issue a report 90-120 days after the spray operation is completed. The report will be posted on the MDAR website (http://www.mass.gov/agr).

Appendix 11: Base of Operations for Conducting Mosquito Control Activities

The decision to conduct an emergency mosquito control operation triggers the immediate contact of any company approved on the current state contract to provide mosquito control, including ground and aerial larviciding and adulticiding. The companies currently under contract to provide these services are referenced in Appendix 7. These companies or their subcontractors will take the lead in determining staging logistics, including identifying staging location(s) and making contact with airport management if the emergency operation involves aerial intervention. If needed, MDAR has a list of airports in a spreadsheet in the MDAR-Contractor Discussions Channel in MS Teams.

Bases of Operations required for any ground-level adulticide or larvicide application treatments (using trucks or backpack sprayers) will be established as needed, with the contractor(s) taking the lead on determining staging areas and MDAR staff providing assistance if requested.

The SRB Operations Coordinator will assist with coordination to ensure MDAR staff are able to be present at the staging area(s) during operations as is warranted.

Appendix 12: SRB Emergency Response Checklist

	Time Frame	Task	Objectives/Details	Collaborators	Done
1	Whenever mosquito-borne virus is detected (in mosquitoes, humans, or other animals)	Advise state agency stakeholders when necessary	• Determine what mosquito control intervention will be most effective to prevent or suppress arbovirus risk, including but not limited to standard surveillance activities, increasing surveillance activities, intensifying and increasing localized control of immature (where practical) and/or adult mosquitoes, and/or acceleration and expansion of adult mosquito control in larger geographical areas.	MCDs, SRB, MDAR, DPH, and MAG	☐
2	January – July	Review, select and approve pesticide product(s) of choice	• Review and select the specific pesticide product(s) to be used in an emergency response	DPH, SRB, DEP, MDAR, DFG	☐
3	January – July	File application to EPA for public health emergency exemption (if required)	• If a new product is selected above, determine whether Federal authorization to use a pesticide not registered for use over crops is needed, if so, obtain.	MDAR	☐
4	If Category 3-4 (Moderate tending toward High, or High) risk level is declared by DPH	Notify stakeholders	• Advise the respective state agencies that make up the SRB. MDAR Deputy Commissioner notifies the Secretary of the EEA. DPH notifies municipalities. Confer with MAG and MCDs. See response plan for details.	SRB, MDAR, DEP, DCR, DPH, MCDs, MAG	☐

	Time Frame	Task	Objectives/Details	Collaborators	Done
5	When (Moderate tending toward High, or High) risk level is declared by DPH	Discuss potential responses	• Initiate emergency conference calls and meetings with state agency stakeholders including but not limited to DPH, MDAR, MCDs, SRB, DFG, DEP, and also MAG, in order to reach consensus on most effective way to prevent or suppress human risk. Keep respective state agency Commissioners of SRB informed as well as EEA. Reach out to emergency mosquito control vendors on contract, as well as BOHs.	DPH, MDAR, SRB, MAG, EEA, and DFG	☐
6	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Follow MOU with DFG	• Notify DFG of emergency operations and request "Certification of Emergency for the purpose of mosquito control" or other necessary certification in accordance with MOU	MDAR, DFG	☐
7	Upon confirmation of pending aerial adulticiding or other emergency operations	Activate vendors on contract	• Contact emergency aerial applicator (or other emergency response contractor) and pesticide provider to ensure the timely deployment of aircraft/other vehicles and pesticides required, if needed.	MDAR, SRB, contractor(s)	☐
8	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION Send letter to vendors on contract	• Draft letter from MDAR authorizing vendor to apply pesticides	MDAR, SRB, contractor(s)	☐

	Time Frame	Task	Objectives/Details	Collaborators	Done
9	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION Send formal authorization to both applicator and pesticide contractor	• Authorize both aerial applicator (or other emergency operations contractor) and pesticide contractor to proceed for the purpose of making pesticide applications over the areas identified	MDAR, SRB	☐
10	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) If aerial adulticide application is to be performed, notify the Federal Aviation Administration (FAA) to assure compliance with state and federal aviation rules and regulations	• Contractor will notify FAA that an aerial intervention will be performed • MDAR will provide letter to contractor indicating that contractor has authorization to do aerial application (template) • Contractor will obtain approval from FAA to apply pesticides for the purpose of mosquito control over Congested Areas (CAP), citing geographic area and beginning and end dates of treatments. A list of media contacts and map of spray area will be required.	Aerial Operations Contractor, MDAR	☐
11	Upon confirmation of pending aerial adulticiding or other emergency operations	Schedule an emergency meeting of the SRB	• Set up emergency SRB meeting to determine the need for an emergency response, including aerial spraying	MDAR, SRB	☐
12	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) If aerial adulticide	• Ensure compliance with state and federal pesticide laws • May be needed if Section 18 applies	SRB, MDAR	☐

		application is to be performed, confirm federal authorization of pesticide product to be used	(public health emergency exemption)		
13	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Delimit area to be treated	• GIS Team lead will work with DPH, DEP and DFG to produce map layers delimiting proposed treatment area	MDAR, DPH, DEP, DFG	☐
14	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Establish base of operations	• Supervise the operation, facilitate communication and decision-making in accord with the operational plans • Consult packing list	MDAR, Contractor	☐
15	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Verify equipment is properly calibrated and characterized	• Ensure any equipment used in emergency operations is in good working condition and in compliance with product labeling and other operational parameters	MDAR, Contractor	☐
16	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Notify MPAL that samples will be delivered	• Arrange for the analyses of all environmental monitoring samples collected pre- and post-application by MPAL (UMass Pesticide Analysis Laboratory)	MDAR, DEP, UMass	☐
17	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Verify efficacy protocol is being implemented	• Verify that DPH is working with MCDs and/or contractors to set up efficacy testing • Have GIS Lead provide maps as needed to determine specific trap sites, both inside and outside of the application area, that will be used for efficacy testing	SRB, DPH, MCDs	☐

	Time Frame	Task	Objectives/Details	Collaborators	Done
18	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Notify and coordinate activities of Public Relations Office of EEA, and DPH Office of Public Health Strategies and Communications	• Ensure coordination between Public Relations Office of respective state agency secretariat responsible to conduct media campaign for dissemination of public health risk info (specific areas that will be treated, timing of application, choice of pesticide, and info to mitigate personal and environmental risks). In the past, DPH has taken the lead on the public health angle.	DPH, MDAR, EEA, Contractor PR services	☐
19	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Designate official(s) to communicate with aerial pilot.	• Designate state official(s) who will supervise the aerial spray operation and communicate with pilot(s) prior to, during, and after spraying operations	MDAR	☐
20	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Assign state personnel for on-site inspection and monitoring	• Designate state officials, in addition to contractor personnel, to inspect airplanes and spray equipment, monitor calibration and characterization of droplets, monitor pesticides being loaded into the aircraft.	MDAR	☐

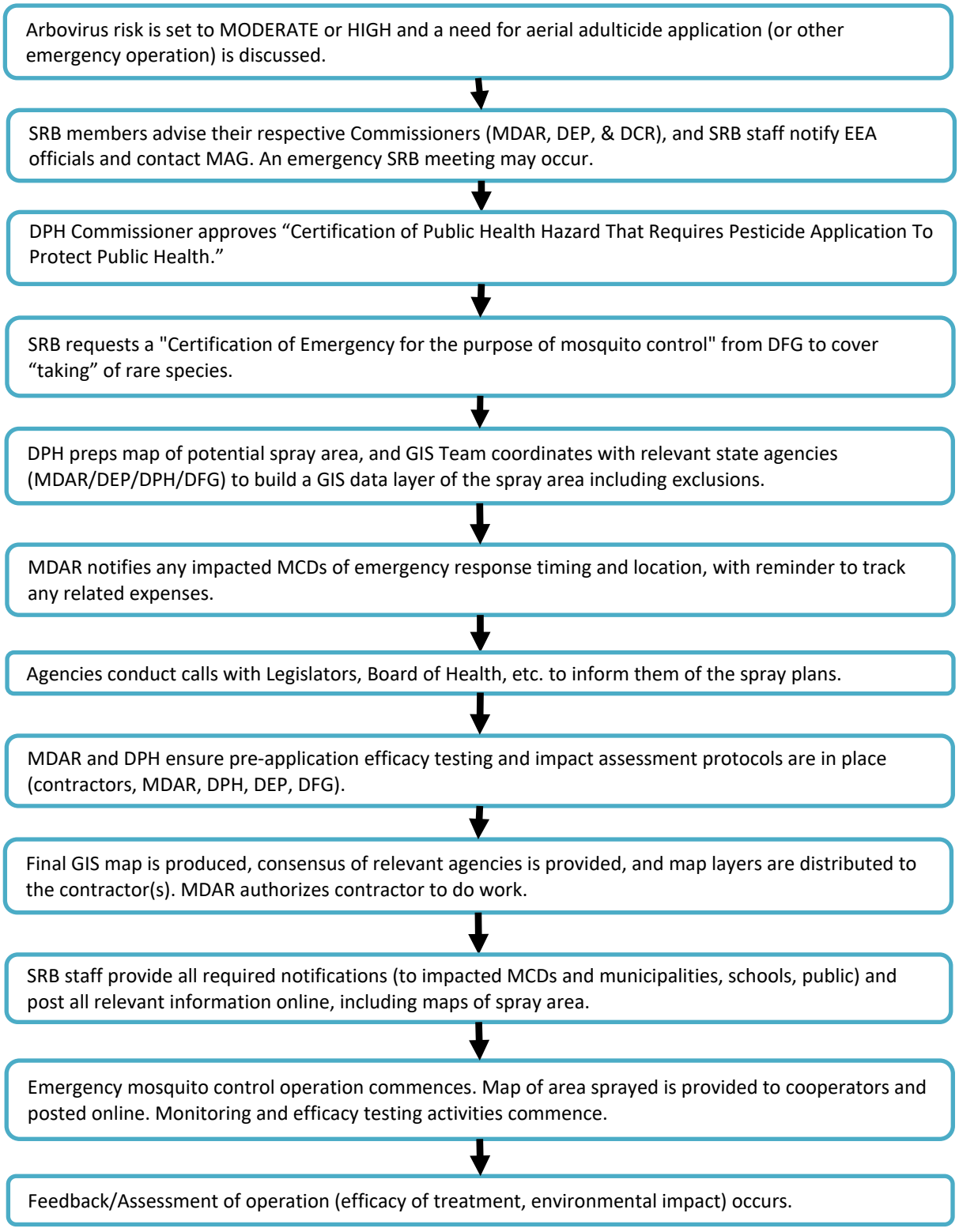
	Time Frame	Task	Objectives/Details	Collaborators	Done
21	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Notify media relative to treatment areas	• Draft a press release detailing: Proposed treatment areas, public health risk communication information, information regarding the pesticide to be used, timing of applications, and information to help mitigate environmental health risks in the municipalities to be treated • Make the above information available via the MDAR/SRB and DPH websites	EEA (Press Office), MDAR, DPH Office of Public Health, Contractor PR services (if available/needed)	☐
22	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Notify local Police Departments in treatment areas	• Help prepare local Police Departments in treatment area such that they are aware of the spray operation to occur in their community and are able to direct individuals calling them to the State's informational resources via established informational hotlines, websites, etc.	MDAR, MCDs	☐
23	Upon confirmation of pending aerial adulticiding or other emergency operations	IMPLEMENT OPERATION (Cont'd) Activate monitoring protocols to evaluate efficacy and monitor environmental impacts	• Activate pre-application protocols to evaluate efficacy and perform monitoring • This includes apiaries, surface water, or other environmental monitoring	SRB, MDAR, contractor, DEP, DPH, MCDs	☐

	Time Frame	Task	Objectives/Details	Collaborators	Done
24	Upon confirmation of pending aerial adulticiding or other emergency operations	Activate notification protocols for beekeepers, aquaculture facilities, certified organic farmers, hemp farmers, schools/daycare facilities, and surface water supply managers. Determine notifications needed and provide them as appropriate	• MDAR Chief Apiary Inspector should notify beekeepers in potential treatment area • SRB Operations Coordinator should notify organic farms, hemp farmers, and aquaculture facilities in potential treatment area • Per 333 CMR 14.00, MDAR should notify schools, childcare programs, and preschools in the potential treatment area • If 2 days' notice is possible, provide Standard Written Notification to public and schools/day care facilities in operations area • If less than 2 days' notice is available, MDAR should provide declaration that a waiver is needed to bypass Standard Written Notification • DEP should notify any surface water supply managers • Follow rules as described in the Communications section	MDAR	☐
25	Upon confirmation of pending aerial adulticiding or other emergency operations	Determine security clearance list	• Create security clearance list of staff (MDAR, SRB, MCDs, etc.) if required for staging area • Determine who at the staging area this list should be provided to and ensure a copy is received before operations commence • Also provide a list to Environmental Police if they are to be on site	MDAR	☐
26	Upon confirmation of pending aerial adulticiding or other emergency operations	Commence Aerial Adulticide Spraying Operation (weather-dependent)	• Commence Aerial Spraying Operation	SRB, MDAR, Contractors	☐

	Time Frame	Task	Objectives/Details	Collaborators	Done
27	Within 30 days of concluded operations	ASSESS OPERATIONS	• Develop report of operations, including final number of acres treated, efficacy results, environmental monitoring results, complaints, etc. • Provide report to respective state agency commissioners and other key state agency stakeholders • Disseminate report as required by 2a legislation • EPA requires that a NPDES permit be submit when using a pesticide over waterway. If possible, this permit should be submitted prior to the application If advanced notice is not possible, due to the emergency nature of the application, the permit should be submitted within 30 days of concluded operations	MDAR, SRB	☐

Appendix 13: Quick Reference Chart for Plan Activation

Mosquito surveillance (conducted by the MCDs and DPH) occurs March-October. DPH performs arbovirus testing June-September and characterizes the arbovirus risk level on a weekly basis, or more frequently if the situation warrants. Medical and veterinary data, and weather/climate data are also monitored. The chart below summarizes the steps that occur once arbovirus risk (typically for EEEv) is set to MODERATE or higher:



Appendix 14: Reference List

Online resources relevant to this plan:

MDAR/SRB

- SRB Website
  http://www.mass.gov/eea/agencies/agr/pesticides/mosquito/
- Massachusetts Aerial Mosquito Spray Map Website
  https://massnrc.org/spray-map
- List of Mosquito Control Districts and Member Cities/Towns:
  https://www.mass.gov/service-details/mosquito-control-projects-and-districts
- State Reclamation and Mosquito Control Board Annual Reports (SRB emergency operations reports and annual reports from Mosquito Control Districts)
  https://www.mass.gov/service-details/state-reclamation-and-mosquito-control-board-annual-reports

DPH

- Massachusetts Department of Public Health Arbovirus Surveillance and Response Plan
  https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data#response-plan-
- DPH Historical arbovirus data
  https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data

TASK FORCE

- Mosquito Control for the Twenty-First Century Task Force Website
  https://www.mass.gov/orgs/mosquito-control-for-the-twenty-first-century-task-force