Model Ecological Mosquito Management Policy and Plan for Communities

Section 1. Purpose

The [enacting entity] hereby finds and declares that abating mosquito-borne disease is best achieved through a science-based approach that prioritizes preventative measures. These measures include surveillance, monitoring, public education on eliminating breeding sites and personal protective actions, consideration of local ecology, habitat manipulation, larviciding with biological materials, full disclosure of all pesticide use, advance notice of spraying, and opt-out opportunities. Mosquito adulticides are found by the [enacting entity] to be hazardous, and should only be considered as a last resort, under strict thresholds, when mosquito-borne disease places public and animal health at risk. Aerially applied mosquito adulticides are excessively risky in exposures to people and nontarget organisms, are relatively ineffective in relation to those risks, and are prohibited in the [enacting community].

Section 2. Findings

WHEREAS mosquito-borne diseases such as [West Nile Virus, Eastern Equine Encephalitis] pose a threat to the health of residents and livestock of [enacting community];

WHEREAS mosquito adulticides pose significant risks to human health and nontarget species, and are the least effective means of managing mosquitoes and mosquito-borne diseases, requiring a greater volume of pesticide over a larger geographic area than larvicides;

WHEREAS infants, children, pregnant women, the elderly, people with compromised immune systems and chemical sensitivities are especially vulnerable to pesticide effects and exposure;

WHEREAS mosquito adulticides are generally synthetic petrochemicals that have been found to contaminate streams, lakes, and drinking water sources where they can persist and bioaccumulate and enter the human food chain;

WHEREAS mosquito adulticides contain inert ingredients that can be more toxic than the active ingredient, and/or increase the overall toxicity of a pesticide formulation, and are not required to be disclosed to the general public;

WHEREAS high functioning wetlands can naturally control mosquito populations;

WHEREAS an ecological approach to pest management is the most effective and least-toxic method available to manage mosquitoes and mosquito-borne diseases;

Section 3. Definitions

For the purposes of this legislation, the following definitions shall apply:

“Adulticiding” means the use of pesticides intended to kill adult mosquitoes;

“Biodiversity survey” means an accounting of the diversity, evenness, and richness of species relevant to mosquito management in a given area;

“Breeding history” means the level of larval and adult mosquito abundance in a given area;

“Ecological analysis” means an examination and review of environmental factors affecting mosquito abundance in a given area;

“Habitat manipulation” means an approach to reducing mosquito abundance by naturally altering the landscape. Habitat manipulation aims to create unfavorable conditions for mosquito populations, and favorable conditions for its predators;

“Habitat quality” means the ability of the environment to provide conditions appropriate for the persistence of mosquito predators at the individual and population level;

“Larvaciding” means the use of pesticides intended to kill larval mosquitoes;

“No spray list” means a list maintained by the [enacting community] of residents who shall not have mosquito adulticides sprayed within 150 ft of their property;

“Wetland and/or wildlife ecologist” means an expert with a master’s or doctorate degree in wetland ecology, wildlife ecology, or a closely related field of ecological study.

Section 4. Surveillance

(1) Trapping and Testing Adult Mosquitoes. [Enacting community] has the option of relying on trapping and testing of adult mosquitoes conducted by the Commonwealth of Massachusetts, or developing its own trapping and testing program, as described below.
    a. The [enacting community] [appropriate agency or board] shall establish and oversee the trapping of adult mosquitoes throughout the [enacting community].
    b. Trapping shall begin [Set_Date] and end [Set_Date], for a total of [Number of Weeks] to correspond with mosquito activity in the [enacting community.] The [appropriate agency or board] may, at its own discretion, change these dates based upon climatic conditions or other outstanding factors.
    c. Traps shall be placed appropriately in the [enacting community] based on risk of disease spread.
    d. Mosquito counts from mosquito traps shall be recorded at regular intervals in a publicly accessible location, such as the [enacting community]’s website.
    e. Trapped mosquitoes may be tested for the following mosquito-borne diseases:
        i. West-Nile Virus (WNV)
        ii. Eastern Equine Encephalitis (EEE)
        iii. Jamestown Canyon Virus

iv. [Other arboviruses of local or regional concern]

f. Based on positive findings of a mosquito-borne disease in tested mosquitoes, or at the discretion of the [appropriate agency or board], the [appropriate agency or board] may test sentinel host species for the presence of mosquito-borne disease.

(2) Monitoring and Mapping Larval Mosquito Breeding Sites. [Enacting community] has the option of relying on monitoring and mapping larval mosquito breeding sites conducted by the Commonwealth of Massachusetts, or developing its own monitoring and mapping program, as described below.

a. The [enacting community] [appropriate agency or board] shall oversee the creation of a map of larval mosquito breeding sites within the [enacting community] that further classifies breeding sites based on habitat quality and breeding history. The following classifications may be used:
   i. Low quality ecological habitat/Low breeding history
   ii. High quality ecological habitat/Low breeding history
   iii. Low quality ecological habitat/High breeding history
   iv. High quality ecological habitat/High breeding history

b. The [appropriate agency or board] shall monitor larval mosquito populations on a regular interval using a diptest. Particular attention is to be paid to sites where known vector mosquitoes breed, and sites with low quality ecological habitat and high breeding history.

c. Monitoring shall begin [Set_Date] and end [Set_Date], for a total of [Number of Weeks] to correspond with mosquito activity in the [enacting community.] The [appropriate agency or board] may, at its own discretion, change these dates based upon climatic conditions or other outstanding factors.

d. The map of larval mosquito breeding sites, their classification, and larval monitoring data shall be maintained in a publicly accessible location, such as the [enacting community's] website.

(3) Ecological Analysis

a. The [enacting community] shall, once a month, conduct an ecological analysis and biodiversity survey in mosquito larval breeding sites. Such a survey shall be conducted in consultation with a wetland and/or wildlife ecologist. The [appropriate agency or board] shall work with the wetland and/or wildlife ecologist to characterize ecological health in the context of mosquito abundance and mosquito-borne disease transmission in the [enacting community]. Such as assessment shall have the aim of further developing non-pesticidal management approaches to reduce mosquito populations.

b. The wetland and/or wildlife ecologist and [appropriate agency or board] shall make all data and analysis available in a publicly accessible location, such as the [enacting community]'s website.

Section 5. Education, Outreach, and Prevention

(1) Public Education and Outreach (PEO) Campaign

a. The [appropriate agency or board] shall, with assistance form the Community Mosquito Task Force, establish and oversee the creation of PEO campaign aimed at informing residents and businesses in the [enacting community] how to reduce mosquito breeding sites in and around their properties and the community at large, preventative measures individuals can take to protect themselves, and proper use of larvicides.
b. The PEO campaign shall inform residents of how mosquito-borne diseases are transmitted in the [enacting community], and the difference between nuisance and disease vector mosquitoes.
c. The PEO campaign shall inform residents of the hazards associated with mosquito adulticides and larvicides, and advise residents how they can opt-out of adulticide applications.

(2) PEO Messaging Methods and Materials

a. The PEO campaign may include but is not limited to the following methods of public outreach:
    i. A publicly accessible website;
    ii. Campaign branded pamphlets, infographics, and/or fact sheets;
    iii. Public meetings/open houses, either in person, or if not feasible, online;
    iv. Videotaped presentations;
    v. Advertisements in public spaces;
    vi. Local public access television or other local media sources;
    vii. Inserts in utility bills
    viii. Inserts into state registration notifications for beekeepers
b. The [appropriate agency or board] shall develop a “mosquito protection toolkit” that will be made available to residents upon their request. This toolkit may include educational information on pesticide hazards, opportunities to opt-out of spraying, personal protection, source reduction and mosquito prevention, larvicidal dunks, child-friendly insect repellent, and other information or supplies at the discretion of the [appropriate agency or board].
c. The PEO shall include a hotline for residents to call/email with mosquito concerns. The [appropriate agency or board] shall respond to these calls by answering concerns and providing an opportunity for the concerned resident to receive a “mosquito protection toolkit.”

Section 6. Mitigation Measures

(1) Source Reduction and Habitat Manipulation

a. Habitat manipulation is a preferred method of reducing recruitment and managing mosquito populations. It may involve, but is not limited to, water management strategies to avoid and eliminate artificially created mosquito breeding areas such as use of Low Impact Development techniques for stormwater management; removal of tires, trash, and abandoned containers or structures; and filling in, improving drainage , or

pumping water out of unmaintained swimming pools or other artificial pools or puddles of water; and improving access to streams and wetlands for fish and other mosquito predators by upgrading culverts, removing dams, or otherwise restoring degraded wetlands. Any habitat manipulation must comply with applicable federal, state and local laws, and be done in coordination with a wetlands and/or wildlife ecologist and the [appropriate agency or board] to ensure the long-term integrity of the manipulated habitat.

(2) Larviciding

a. Larval mosquito control through larviciding is considered an acceptable and effective method to reduce nuisance and vector mosquito populations.
b. The preferred larval control agent for the [enacting community] shall by the microbial insecticide *Bacillus thuringiensis subspecies israelensis*, or Bti. The community shall not use any larvicide containing the chemical growth regulator insecticide methoprene.
c. The [appropriate agency or board] shall establish thresholds for larvicide use and shall apply larvicides based on the monitoring of breeding sites. Particular attention is to be paid to sites where known vector mosquitoes breed, and sites with low quality ecological habitat and high breeding history.
d. Aerial application of any larvicide is prohibited in the [enacting community].

(3) Adulticiding

a. Mosquito adulticides are considered the most dangerous and least effective method of reducing nuisance and vector mosquito populations.
b. Adulticides are prohibited to be used to manage nuisance mosquitoes populations, and shall only be considered following the detection of a mosquito-borne pathogen in mosquito or sentinel species.
c. The [enacting community] shall establish thresholds for adulticide use based upon the risk of mosquito-borne disease transmission to public health.
d. Following the detection of a mosquito-borne pathogen in an adult mosquito or sentinel species, the [enacting community] shall take the following actions:
    i. Notify the public and increase PEO, emphasizing personal protection measures
    ii. Begin or increase the trapping of adult mosquitoes in the area of detection;
    iii. Begin or increase larval monitoring and management in the area of detection;
    iv. Prioritize further testing for mosquito-borne diseases in the area of detection;
    v. Consider non-pesticidal management approaches to reduce mosquito populations in the area of detection.

e. Following the detection of a mosquito-borne pathogen in an adult mosquito or sentinel species, if the established threshold has been met, the [appropriate agency or board] may consider the ground application of adulticide using a backpack applicator, provided:
    i. The backpack-applied adulticide application occurs only within the immediate area of detection;
    ii. The backpack-applied adulticide is the least toxic adulticide available. Preference is given to adulticides that are certified by the Organic Materials Review Institute (OMRI) (such as Clarke's Merus 2.0) or may be classified under EPA's minimum risk pesticide program (such as Naturecide All Purpose Commercial Concentrate)
f. If monitoring and trapping data indicate a broader concern of mosquito-borne disease in the community, and education, prevention, habitat manipulation, larviciding, and backpack-applied adulticiding have all been attempted and determined insufficient to address an immediate threat to public health from mosquito-borne disease, the [appropriate agency or board] may, based on alignment with an established threshold, consider the truck-mounted ground application of a mosquito adulticide containing a synthetic pyrethroid, provided the application occur within the most limited area possible to achieve effective reduction in adult vector mosquitoes.
g. The [appropriate agency or board] shall increase monitoring and trapping following the application of a mosquito adulticide, and shall work with a wetland and/or wildlife ecologist to characterize the impacts adulticide use had on the ecological health of the habitat where the adulticide was applied.
h. Aerial application of any adulticide is prohibited in the [enacting community].
i. Any application of a mosquito adulticide shall be performed by a certified pesticide applicator.

Section 7. Community Mosquito Task Force

(1) Establishment
    a. The [appropriate agency or board] shall establish a Community Mosquito Task Force (hereinafter "Task Force") that includes the following members from the Enacting Community:
        i. One member of the Board of Health [or similar appropriate agency or board]
        ii. One member of the Conservation Commission
        iii. One member of the Water Commissioners or Water Management Committee
        iv. One state registered beekeeper, if available
        v. One certified organic farmer, if available
        vi. One wetland and/or wildlife ecologist
        vii. One former or current medical physician

b. The Task Force shall elect a chairperson from its membership, and any other officers it deems necessary. The terms of members shall be [X] years. In the event of a vacancy, a new member shall be appointed for the unexpired term in the same manner as the original appointment. The first meeting of the Task Force shall be called by the first-named member. The first meeting of the Task Force shall be held within [X] months of the effective date of this section. Three members of the Task Force shall constitute a quorum. All members of the Task Force shall disclose to the [appropriate agency or board] any potential conflicts of interest.
c. The Task Force shall meet at least 2 times annually, and from time to time at the call of the chairperson or upon the request of any 3 members. Minutes of all meeting shall be kept on file with the [enacting community] clerk's office.

(2) Powers, Function, and Duties

a. The Task Force shall serve in an advisory capacity to the [appropriate agency or board] to oversee this mosquito management plan within the community, including the following duties:
    i. Advise the [appropriate agency or board] of any problems or potential changes that may be necessary to improve the effectiveness of mosquito abatement in the [enacting community];
    ii. Assist the [appropriate agency or board] in the implementation of the Public Education and Outreach Campaign;
    iii. Assist the [appropriate agency or board] in the yearly evaluation of the [enacting community's] mosquito abatement approach;
    iv. Consult with and receive comments from residents of the [enacting community] regarding the [enacting community's] approach to mosquito abatement;
    v. Any additional responsibilities as may be deemed necessary by the [appropriate agency or board].
b. The [appropriate agency or board] shall notify the Task Force of any planned adulticide application prior to the notification of residents. Any 3 members of the Task Force may call an emergency meeting to review the need for an adulticide application, and request additional information from the [appropriate agency or board].
c. The Task Force may conduct a vote to approve or disapprove the planned adulticide application.

Section 8. Notification and Opt-Out

(3) Notification

a. At least 72 hours prior to the application of any mosquito adulticide, the [appropriate agency or board] shall provide residents of the [enacting community] public notice of the planned application.
    i. Notice shall be provided through reasonable means, including but not limited to announcements in local newspapers or other

press, and the [enacting community's] website and social media feeds. Such notice shall include information on the risks posed by the adulticide, as well as personal protective measures and other preventative actions residents can take to reduce mosquito-borne disease transmission.

ii. Residents within ½ mile of the planned adulticide application shall be provided with an educational pamphlet about the planned spraying, including the adulticide's label and MSDS sheet, further information about the risks posed by the adulticide, specific precautions residents may take to avoid exposure to the adulticide or deposition of the adulticide on sensitive private property (such as gardens and children's play equipment), as well as personal protective measures and other preventative actions residents can take to reduce mosquito-borne disease transmission.

iii. If feasible, the [appropriate agency or board] shall notify residents within ½ mile of the planned application through a reverse 911 call, or community Blackboard. If state-registered beekeepers are within the ½ mile planned application area, notification shall also be conducted through contact information provided to the state apiarist.

(4) Opt-Out

a. The [appropriate agency or board] shall establish a "no spray list" and provide an opportunity for residents to opt-out of adulticide applications through reasonable means.
b. State registered beekeepers and certified organic farms shall be automatically placed on the "no spray list", and shall be notified through reasonable means that they are on the list.
c. Residents on the "no spray list" shall not have an adulticide applied within 300 feet of their property line.
d. Residents on the "no spray list" shall be notified via reasonable means that they are on the list, and shall be reminded each year following, via reasonable means, that they remain on the "no spray list."

Section 9. Reporting and Evaluation

(1) Each year, the [appropriate agency or board] shall work alongside the Community Mosquito Task Force, a wetland and/or wildlife ecologist ,and other relevant experts to review the effectiveness of the [enacting community's] mosquito abatement approach and publish the findings in a report. The report shall include successes and failures of the past year, a survey of the experience of state registered beekeepers and certified organic farms, as well as additional steps the [appropriate agency or board] will consider to further reduce reliance on pesticide use and improve local ecological capacity to naturally manage nuisance and vector mosquitoes.

(2) Findings in the report are to be submitted to the [enacting entity] and made available in a publicly accessible location, such as the [enacting community]’s website.

Section 10. Effective Date. This law shall take effect [X months] after passage.