MCTF Best Practices Subcommittee
Final Recommendations: February 28, 2022

Best Practices Subcommittee Final Meeting

This file presents the recommendations prepared and voted on by the MCTF Best Practices Subcommittee and the voting results:

- **BP-1: Improving Consistency in the Implementation of Integrated Pest Management**
- **BP-2: Limiting Ground-Based Applications of Adulticides**
- **BP-3: State-Wide Mosquito Surveillance**
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- **BP-10: Protection of Receptor Areas from Pesticide Run-Off**
- **BP-11: Reduce Pesticide Applications for Nuisance Control**
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- **BP-13: Research the Impacts of Pesticides on Vulnerable Populations**
- **BP-14: Criteria for Declaring a Public Health Hazard**
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- **BP-16: Protected Status of Certified Organic Farms**
- **BP-17: Enhancing and Updating Wetlands Management within Integrated Pest Management**

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-1: Improving Consistency in the Implementation of Integrated Pest Management

Background

Integrated Pest Management (IPM) is defined in the Massachusetts Pesticide Control Act (Chapter 132b) as "a comprehensive strategy of pest control whose major objective is to achieve desired levels of pest control in an environmentally responsible manner by combining multiple pest control measures to reduce the need for reliance on chemical pesticides; more specifically, a combination of pest controls which addresses conditions that support pests and may include, but is not limited to, the use of monitoring techniques to determine immediate and ongoing need for pest control, increased sanitation, physical barrier methods, the use of natural pest enemies and a judicious use of lowest risk pesticides when necessary." Although the principles of IPM underlie the practice of mosquito control in Massachusetts, there is a) a lack of consistency in the implementation of IPM across the state and b) no statewide system for documenting mosquito control actions and associated results. Inconsistent application of IPM and lack of efficacy information for IPM components may result in an increase in the amount of pesticide released into the environment without a commensurate benefit in the reduction of mosquitoes or of mosquito-borne diseases.

Recommendation

The implementation of IPM should follow the science-based guidelines and protocols established in a new statewide Mosquito Management Plan to promote more consistent use of all components of IPM across the state. The Board overseeing mosquito control in the Commonwealth of Massachusetts should direct the preparation of the Plan. The Plan should provide operational guidance and best practices for state agencies and MCDs including a) implementation guidance on each IPM component; b) rationale and thresholds for each IPM component; c) guidance for flexibility in implementing IPM; d) a summary of actions taken, lessons learned, and program data analysis since the prior report; e) evaluation of effectiveness and non-target impacts (i.e. human health and ecological impacts) of each IPM component as deemed appropriate and practical by the Board; and f) a summary of new developments in all aspects of IPM for mosquito control using best available information and new data. Additionally:

- As defined in Chapter 132b, the Plan should involve a combination of "multiple pest control measures to reduce the need for reliance on chemical pesticides." In other words, activities including but not limited to surveillance, public outreach and education, and source reduction, when applicable, should be prioritized over the usage of chemical pesticides.
- The existing MDPH MA Arbovirus Surveillance and Response Plan and the MDAR MA Operations Response Plan for Mosquito-Borne Illness would be incorporated into the Plan.
- The Plan should include flexibility in mosquito control responses tailored to differences such as in geography, habitats, disease risk levels, season and weather conditions, mosquito species and abundance, and density of residences.
- Updates should consider input from the public as well as the involvement of stakeholders. All components of the Plan should be updated at a minimum of once every [three years]. Stakeholders should convene annually to determine whether individual components need to be updated more frequently.

- Establish communication with Beekeepers via the State Apiary Inspector, Mass Bee and Local County Bee Clubs so beekeepers can incorporate best management practices to protect their hives with at least 48 hours' notice in event of spraying.

Voting Results

- Seven subcommittee members supported this recommendation.
- Two subcommittee members did not support this recommendation. The reasons for the dissenting opinions were:
  - One supported everything about this recommendation other than the last bullet point about establishing communication with beekeepers. Since the last bullet point was added last minute, the subcommittee member hadn't had time to think about how it might be accomplished.
  - One felt that this would entail micromanaging the MCDs and unnecessarily prescribing action thresholds. The results might be a program that would withhold efforts that might otherwise provide benefits, or trigger responses that experts might consider unjustified.

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-2: Limiting Ground-Based Applications of Adulticides

Background

Not developed.

Recommendation

MCDs should conduct ground-based adulticiding applications only when alternative methods (e.g., source reduction, water management, or larviciding) are not feasible or have been insufficiently effective, and when clear thresholds for spraying are met. These thresholds should be determined by consideration of mosquito surveillance data that demonstrate elevated disease risk or the aggregation of significant number of complaints. Thresholds may be tailored based on factors such as geography, habitat, season, weather conditions, mosquito species and abundance, and density of nearby residences.

Voting Results

- Six subcommittee members supported this recommendation.
- Three subcommittee members did not support this recommendation. The reasons for the dissenting opinions were:
  - One felt like this wasn't different from the status quo given that it included the aggregation of complaints.

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-3: State-Wide Mosquito Surveillance

Background

Monitoring of mosquitoes and surveillance of agents of mosquito-borne disease are essential components of mosquito management in the Commonwealth of Massachusetts. The accumulated data and analyses of trends can inform decisions as to the manner of any intervention and public educational messaging. Current monitoring efforts are performed mainly by personnel from Mosquito Control Districts (MCDs), and such activities are primarily limited to communities that support their regional MCD. Therefore, there has historically been limited data available from communities that are not part of MCDs, which limits evidence-based risk assessment and decision-making in those areas resulting in an incomplete understanding of mosquito species distribution, populations, and disease risk at the state level necessary for a comprehensive statewide control strategy.

Recommendation

The legislature is encouraged to authorize and fund an enhanced monitoring network to include areas of the Commonwealth that are not currently served by a regional MCD. The goals would be to increase the spatial coverage of monitoring mosquitoes that are particularly relevant as vectors of disease agents, and to perform surveillance for those vector-borne agents. Surveillance will be guided by a protocol that includes standards for implementation and analysis. Areas to be monitored should be selected on ecological and epidemiological bases rather than on political boundaries. A state-wide agency should be responsible for overseeing this program to ensure procedural and analytical consistency. Said agency can partner with qualified entities as appropriate.

Voting Results

- Eight subcommittee members supported this recommendation.
- One subcommittee member abstained.

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-4: Improving Consistency in MCD Staffing

Background

Newer and/or smaller MCDs may not have available entomological and wetland biology/permit specialist expertise. Objective data may thereby be lacking to inform decisions in those areas.

Recommendation

Each MCD should employ or consult with an entomologist to identify mosquitoes, and a wetland biologist/permit specialist to evaluate/oversee habitat modification efforts.

Voting Results

- Seven subcommittee members supported this recommendation.
- One subcommittee member did not support this recommendation. The reason for the dissenting opinion was:
  - The subcommittee member had budget concerns for individual MCDs being able to afford this. Consulting was fine, but sometimes that wasn't an option for payment. Perhaps if the policy structure SC changed the funding structure this would be feasible.
- One subcommittee member abstained.

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-5: Statewide Education on Mosquito Management

Background

Educational outreach regarding mosquito management is currently fragmented and uncoordinated in the Commonwealth. Further, no MCD has access to the platform that is available to state officials to get out a consistent and repeated message of wide concern.

Recommendation

A state agency should be principally responsible for statewide education on mosquito management.

Voting Results

- Nine subcommittee members supported this recommendation.

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-6: Prohibit Aerial Applications of Adulticides

Background

There is a lack of proven efficacy of aerial adulticiding in preventing human disease. At the same time, there is likely harm to human and ecological health due to spraying.

Recommendation

The aerial application of adulticides should be prohibited.

Voting Results

- ***Five subcommittee members did not support this recommendation.***
- Four subcommittee members supported this recommendation. The reasons for the dissenting opinions were:
  - One subcommittee member didn't see the efficacy in aerial spraying that's done at the typical scale.
  - One subcommittee member didn't feel like there were adequate safeguards for humans and ecological nontarget species.
  - The last subcommittee member wanted to echo the previous statement and felt like the state would be better off spending time and energy educating the public than engaging in aerial spraying.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-7: Online Reporting for Commercial Applicators

Background

There is a lack of understanding of the scale of commercial pesticide applications for mosquito control; moreover, commercial pesticide applicators working in the private sector in Massachusetts have to submit annual use reports via paper mail. Having more ready access to this information through an online system, in addition to including locational information, will allow state agencies to assess private mosquito control measures in conjunction with state control measures for a more complete understanding of annual statewide mosquito control measures.

Recommendation

Develop an online reporting system for mosquito control-related pesticide application records from commercial applicators working in the private sector. This system will replace the current paper-based reporting and will expand the current reporting requirements to identify the location of the application. The information reported to this online system should include product name, EPA registration number, application method, location of application by town, and total amount of product applied, as well as identify the application target as for mosquito control. Reporting will be required at least annually. Funding should be allocated for developing and maintaining this system.

Voting Results

- Nine subcommittee members supported this recommendation.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-8: Communication with Public Water Systems

Background

Currently there is insufficient communication with public water systems about aerial spraying events. This means that public water systems may not be able to adequately prepare for the impacts of these events.

Recommendation

Develop an electronic GIS-based system where pesticide applicators communicate spray application plans for aerial and MCD truck-based spray applications. Mass DEP will assist in this endeavor to ensure the MCD and aerial spray applicators can easily view the location of surface water supplies as well as the 500-foot aerial application and 300-foot truck-spray buffer zones on all statewide mapping while still maintaining the security of PWS source locations. Additionally, Mass DEP shall also develop and implement a training program. The main training program goals are to help PWSs 1) understand the stakeholders involved and the protective methods employed during applications, 2) comprehend spray event sampling protocols, 3) communicate "no spray zones" or voice questions to local MCDs, and 4) review local aerial and MCD truck-based spray application information. MassDEP can furthermore assist PWSs by providing sample language and response actions for inclusion in Emergency Response Plans.

Voting Results

- Eight subcommittee members supported this recommendation.
- One subcommittee member did not support this recommendation. The reason for the dissenting opinion was:
    - One subcommittee member felt like it would be easier for public water supplies to provide MCDs with information and cut out the middleman entirely, then the MCDs could just exclude those areas.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-9: QA/QC Testing of Chemicals Used in Mosquito Control

Background

Not developed.

Recommendation

The Board shall develop a quality assurance/quality control chemical management program that implements systematic review and verification of bulk chemical purchases used in aerial and MCD-based truck applications. The protocols shall focus on reviewing manufacturer and/or independent laboratory analysis data and plans that highlight the parties and their associated role in manufacture, packaging, storage, and transport. This review shall be conducted during the procurement process and prior to a delivery. Secondly, the program shall detail protocols and safeguards for quick, pragmatic tests adopted for chemical delivery acceptance and pre-application. In cases of bulk purchases, used for widespread use by many MCDs or the state, the protocols can allow for lot-based testing where a subset of containers from the same source are tested. Thirdly, the program shall also highlight delivery rejection procedures in cases of chemical quality issues, and inability to meet requirements stated in delivery acceptance tests, the purchase specification, or any issue associated with residual or apparent contamination.

Voting Results

- Five subcommittee members supported this recommendation.
- Three subcommittee members did not support this recommendation. The reasons for the dissenting opinions were:
  - One subcommittee member felt that as drafted, the program is not sufficiently justified and the process would be cumbersome, expensive, and impractical.
- One subcommittee member abstained.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-10: Protection of Receptor Areas from Pesticide Run-Off

Background

Not developed.

Recommendation

The Legislature shall fund and the Board shall implement additional research to investigate potential impacts from mosquito-related pesticide run-off on private well sources, wetlands, Public Water System groundwater source supplies, apiaries, fisheries, streams, farms, recreational water bodies, or any other sensitive receptor as defined by the Board. Research studies shall include, at a minimum, studies on both larvicides and adulticides as well as testing of alternative pesticides and/or formulations with the purpose of identifying if alternative-method applications are needed in certain receptor areas or if application restrictions are recommended. Following research studies, the implementing researcher shall present scientific findings to the Board.

Voting Results

- Five subcommittee members supported this recommendation.
- Three subcommittee members did not support this recommendation. The reasons for the dissenting opinions were:
  - One subcommittee member felt like the recommendation had gotten muddied. The inclusion of honeybees didn't make sense in terms of runoff; the initial discussion started with drinking water, and the current recommendation didn't seem to capture what the group was trying to accomplish with it.
  - Another subcommittee member saw this as a research endeavor and saw that it seemed to be seeking a problem that didn't exist.
- One subcommittee member abstained.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-11: Reduce Pesticide Applications for Nuisance Control

Background

Not developed.

Recommendation

In consultation with MCDs, consider ways to reduce or restrict the number of individual requests for nuisance controls.

Voting Results

- ***Five subcommittee members did not support this recommendation.***
- Three subcommittee members supported this recommendation. The reasons for the dissenting opinion were:
  - One subcommittee member hoped that this would get addressed through the larger overhaul of the program but didn't think that there should be spraying on-demand, either by the state or by commercial applicators.
  - Another member echoed the comment about no spraying on demand for nuisance requests.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-12: Monitoring and Evaluations After Spraying

Background

Currently, MA has limited ecological monitoring in place following aerial adulticide spraying events and does not have a monitoring plan in place to assess the impacts of vehicle adulticide spray events. According to the MA DPH, Arbovirus Surveillance and Response Plan[1], monitoring prior and post aerial adulticide spraying includes:

- Pre and post monitoring of public drinking water supplies and surface areas in the spray area (such as what was conducted in 2019)[2],
- DEP and MDAR conduct pre and post monitoring of honey bees
- All agencies collaborate (DEP, MDAR, DFW, and DPH) in trying to development environmental monitoring plans. For example, following an aerial spray event in 2006, the MA DEP conducted water sampling, macroinvertebrate surveys, and insect field collections to determine the impact of insecticide spraying on non-target species[3]. To our knowledge, there is not record of similar studies conducted after other aerial spray events, even after the multiple events in 2019.
- Aerial spraying of insecticides is covered under EPA's National Pollutant Discharge and Elimination System (NPDES) and therefore the SRB must submit a notice of intent prior to spray events that will include application of bodies of water. If the application area includes Priority Habitat Areas for endangered species, then the SRB must request a permit from the Department of Fish and Wildlife.

Although there is limited ecological monitoring in MA following vehicle based adulticide spraying, there is evidence of ecological impacts elsewhere (e.g., Philips et al., 2014[4]). To determine if adulticide spray events in MA are causing impacts to non-target receptors, the state should design an ecological monitoring program that will reveal when impacts are occurring. This information can guide best practices to minimize these impacts. However, designing an effective monitoring program requires knowledge of which non-target receptors may be at greatest risk for adverse effects. Performing pilot monitoring projects is recommended to inform the creation of a new monitoring program.

References

1. Bharel and Cranston, 2021. Massachusetts Arbovirus Surveillance and Response Plan. Massachusetts Department of Public Health. Available at, https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data.

2. MassDEP, 2020, Response to Eastern Equine Encephalitis Virus Mosquito Control Aerial Spray Events 2019: A Summary of the Surface Water Quality Sampling Operations. Available at, https://www.mass.gov/doc/response-to-eastern-equine-encephalitis-virus-mosquito-control-aerial-spray-events-2019/download

3. MA State Reclamation and Mosquito Control Board, 2010. Final Report: Aerial adulticiding intervention to diminish risk of Eastern equine encephalitis virus (EEEV), Southeast Massachusetts. Available at, https://www.cmmcp.org/sites/g/files/vyhlif2966/f/uploads/final_report_-_aerial_adulticiding_intervention_to_diminish_risk_of_eeev_2010.pdf

4. Phillips, B.M., Anderson, B.S., Voorhees, J.P., Siegler, K., Denton, D., TenBrook, P., Larsen, K., Isorena, P. and Tjeerdema, R.S., 2014. Monitoring the aquatic toxicity of mosquito vector control spray pesticides to freshwater receiving waters. *Integrated environmental assessment and management*, *10*(3), pp.449-455.

Recommendation

To determine if adulticide spray events are causing impacts to non-target receptors, the state should design an ecological monitoring program:

1. Charge the appropriate state agencies to design an effective ecological monitoring plan to assess impacts to non-target receptors following aerial and truck-based adulticide spray events. This monitoring plan will detail which types of biological and chemical surveys should be conducted, when these surveys should occur, and their frequency. Agencies and departments involved in mosquito control (DPH, Mosquito control districts) should be involved or consulted during plan development to ensure consideration of logistics and practicalities of adulticide spray events (e.g., limited notice of spray events, unanticipated changes made to spray plans).
2. To best inform the design of the ecological monitoring plan, state agencies should conduct pilot research projects to determine vulnerable receptors and the environmental compartments where adulticides are applied and/or accumulating. Pilot projects could include experiments before and after adulticide spray events and should take into account that some areas receive multiple adulticide applications over the course of the mosquito season. Pilot projects should consider both chemical monitoring of appropriate media (water, soil, sediments) and hive products, macroinvertebrate surveys in impacted water bodies, insect field collections, and surveys of pollinators and honeybees.

Funding and personnel resources should be allocated for pilot research projects and for the design and on-going implementation of the monitoring plan.

Voting Results

- Nine subcommittee members supported this recommendation.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-13: Research the Impacts of Pesticides on Vulnerable Populations

Background

Not developed.

Recommendation

Fund research into the impacts of pesticide applications for mosquito control on vulnerable populations (e.g., persons with respiratory or immune system illnesses, persons with multiple chemical sensitivities). Findings from the research should inform the future development of procedures to protect human health.

Voting Results

- Eight subcommittee members supported this recommendation.
- One subcommittee member did not support this recommendation. The reason for the dissenting opinion was:
    - One subcommittee member felt that this recommendation was based on highly controversial and fatally flawed assumptions.

Directive: *(vi) Developing procedures to protect human and ecological health and minimize non-target impacts of mosquito pesticides, including, but not limited to, effects on persons with respiratory or immune system illnesses, drinking water supplies, pollinators and aquatic life*

Recommendation BP-14: Criteria for Declaring a Public Health Hazard

Background

Not developed.

Recommendation

The declaration of a public health hazard related to mosquito-borne disease should be based on published and research-based criteria. To promote transparency, relevant participants (e.g. DPH, SRB, MCDs, and/or local health agencies) should document their decision-making process in the Mosquito Management Plan on an annual basis regardless of whether a public health hazard is declared.

Voting Results

- Eight subcommittee members supported this recommendation.
- One subcommittee member did not support this recommendation.
    - One subcommittee member felt that this currently exists within the DPH Arbovirus plan so he didn't think this would change much at all.

Directive: *(iv) Protecting organic agriculture from pesticide use*

Recommendation BP-15: Agriculture Opt-Out

Background

Not developed.

Recommendation

1. The current opt-out from aerial spraying that is offered to any farm that is USDA certified organic should also be offered to any farm that is 2 acres or more in size and produces food for sale or donation and uses generally recognized organic practices AND any farm that produces for sale or donation honey, pollen, live bees, or other products derived from bees
2. The procedure for opting out of aerial spraying shall be that outlined in 333 CMR 13.03.

Voting Results

- Five subcommittee members supported this recommendation.
- Four subcommittee members did not support this recommendation.
  - One subcommittee member felt that this recommendation placed the fiscal health of farmers ahead of public health considerations.
  - Another felt that this would jeopardize the certified organic operations and would not be implementable.

Directive: *(iv) Protecting organic agriculture from pesticide use*

Recommendation BP-16: Protected Status of Certified Organic Farms

Background

Currently, the protection from aerial spraying afforded to certified farms is a DPH policy, but not a law, and as such is revocable by executive action. Should the legislature deem it necessary to reverse that protection for a specific arbovirus outbreak, they could vote to do so.

Recommendation

Codify the protection from aerial spray for certified organic farms in legislation, not just in policy.

Voting Results

- Seven subcommittee members supported this recommendation.
- Two subcommittee members did not support this recommendation.
    - Both felt that this recommendation was separate from mosquito management decisions.

Directive: *(i) Facilitating the use of integrated pest management*

Recommendation BP-17: Enhancing and Updating Wetlands Management within Integrated Pest Management

Background

Not developed.

Recommendation

The updated Mosquito Management program should include an enhanced emphasis on advancement of ecologically based wetlands and waterways restoration practices for source reduction, as a key element of IPM under the new statewide Mosquito Management Plan.

- The new program structure should facilitate increased cooperation and collaboration among mosquito control districts, the Division of Ecological Restoration, other government agencies, nonprofit organizations, wetland scientists, and municipalities to integrate coastal and inlands restoration and stewardship with mosquito management.
- Innovative techniques for managing salt marshes and for restoring inland wetlands and fisheries should be integrated into updated best practices for mosquito management as specified in the Mosquito Management Plan.

Voting Results

- Seven subcommittee members supported this recommendation.
- One subcommittee member did not support this recommendation.
- One subcommittee member abstained.