Recommendations of the Mosquito Control for the Twenty-First Century Task Force

Appendix D: Public Comments

This appendix includes a compilation of all of the public comments submitted to the Mosquito Control for the Twenty-First Century Task Force public comment portal from August 2020 through March 29, 2022. To facilitate review, an excel document index of all public comments can be found on the following webpage: https://www.mass.gov/service-details/mosquito-control-for-the-twenty-first-century-task-force-meetings

Public Listening Sessions - summary of oral public comments

May 3, 2021

February 10, 2022

Public Comments

August 2020 - March 29, 2022

Please note that comments are presented in chronological order by tranche, although comments within each tranche may not be chronological. This includes all written comments submitted in association with the public listening sessions.

PUBLIC LISTENING SESSIONS

May 3, 2021

February 10, 2022

<u>Mosquito Control Task Force Listening Session</u>
Summary of Oral Comments
May 3, 2021; 11:00-1:00pm

The purpose of this session was for the Mosquito Control for the Twenty-First Century Task Force to accept comments pertaining to mosquito control, for the task force to use in developing recommendations. This session was held remotely under the Governor's Order issued on March 12, 2020, which authorizes a public body to meet remotely and suspends the requirement of a quorum on the body being physically present at the meeting location.

Attendees signed up if they wished to speak at the listening session. All attendees who signed up before 12:55pm were called upon to speak. It was requested that comments be kept to about 3 minutes, to ensure as much feedback as possible was shared with the task force. Written comments related to this session were accepted through May 5 at 5:00 p.m.

The listening session commenced at 11:03 a.m. Dan Sieger provided an introduction, presented a series of background slides and ground rules, and then opened the public comment period.

The Mosquito Control Task Force received oral comments from 38 separate individuals. There were 258 attendees in the session, which included task force members and Commonwealth of MA employees.

The session concluded at 1:17 p.m.

Summary of Oral Comments

The following notes summarize comments received by listening session attendees.

- Questions and comments about the mosquito spraying opt-out programs
    - Program to enable municipalities to opt-out of SRMCB mosquito control spraying:
        - Several comments proposed that that this be an opt-in program, versus an opt-out program
        - Open questions:
            - Should participation in an MCD exempt a community from state mosquito control intervention?
            - Could local decisions to opt-out of mosquito control district spraying carry over to SRMCB spraying?
        - Related to process itself:
            - Several questions were raised by members of the public that pertained to municipalities' decisions to opt-out of SRMCB spraying. Attendees were notified of process by which questions could be answered
            - Comments were made that indicated concern over municipality notification of the program announcement, requested additional information and communication on program by EEA
    - Comment proposed that individual property owner requests for opt-out should never be nullified during state of emergency, especially for people requesting due to specific health conditions
- General opposition to pesticide use in control of mosquitoes included:
    - Concern about potential impacts of spraying – 18 comments spoke to this
        - Comments included concern about impacts of spraying on organic farms (3), bees and other pollinators (6), birds (2), fishing industry incl. lobsters and other aquatic life (2), pets (1), other insects (4), nuisance mosquitoes (i.e., non-virus carrying mosquitoes that play a role in the ecosystem) (1), in addition to general mentions of biodiversity and ecological impacts
        - Concern about impact of spraying on medical conditions (3) – particularly as it pertains to respiratory and chemical sensitivities
        - Comment that residents moved to towns to access wetlands and forest environments – should be able to maintain pristine conditions for those residents
        - Comment pertaining to observed reduction in biodiversity
        - Comment noting that there are a lot of residual effects we see today from chemicals used in the 1950s and beyond – on biodiversity and on drinking water and groundwater
        - Concern about impact of emerging chemicals entering soil and groundwater, and potential for unintended consequences thereafter
    - Concern over pesticide ingredients
        - Concern that products do not list all of their ingredients because they are proprietary or inert, and that the public doesn't know how ingredients may interact

        - Concern over potential effects of inactive ingredients
        - Comment on the European precautionary principle, which requires a producer to prove it is not harmful before allowed on market, while onus falls on public in the U.S. – there are challenges of proof of harm without access to all pesticide ingredients
        - Comment on EPA pesticide review processes and history of EPA product approval/denial – legal use does not necessarily mean a product is safe
        - Comment that adulticide spraying should not be part of integrated mosquito solution until proven safe
        - Comment that we are not always aware of all the risks of pesticides or herbicide use
        - Comment about concerns with pace in which emerging chemicals enter the market
    - Concern over PFAS in pesticides
        - Questions were raised with interest in a status update on the presence of PFAS in the containers in which the mosquito control pesticides are held
        - Concern about use of pesticides with PFAS in towns that use well water
- General comments on support for components of mosquito control included:
    - Comment that MA mosquito control projects meet and exceed industry standards by focusing on source reduction in public lands, training workers, disease and surveillance, and public outreach
    - Comment that MA districts are committed to best practices; support for the management practices governing the MCDs
    - Comment that MA spraying follows all scientifically based principles, including standards of integrity, peer review, and public transparency
    - Comments related to approach with integrated mosquito management ("IMM"):
        - IMM controls mosquitoes without significant risk to people or the environment
        - Adult treatment with spraying is one component of a solid pest management program
    - Comment that mosquito control staff in MA are licensed by state and annually there are continuing education classes provided through training programs or attending annual December meetings
    - Comment indicating support for prioritizing public education, individual responsibilities, and personal spraying and protection
    - Comment indicating support for a mosquito control program that employs ecological management strategies
    - Comment reiterating importance of mosquito control in providing for public health and protecting against bioterrorism agents
    - Comment that MA does good job educating public on avoiding bites
- Comments related to access to data and information
    - Request that resources be shared with municipalities, in order for municipalities to effectively execute upon goals of mosquito control
    - Members of the public made several requests for data and information:
        - Efficacy of spray events in reducing mosquito populations

        - Efficacy of larviciding in reducing vector-borne disease
        - Evaluate impact of mosquitoes on human health
        - Evaluate impact of mosquitoes on outdoor industries and economies
        - Pursue universal surveillance of mosquito borne disease in MA
        - Does aerial spray reach the ground and have an impact in heavily forested areas?
        - Is it feasible for aerial spraying to adhere to town boundaries?
        - Information on studies on bird migration, and/or any plans to direct attention to this into the future
        - Comparison of science on public health vs. conservation, to ensure mosquito control policies are balanced
        - Comparison of mosquito-borne illnesses to other public health issues
        - Evidence of the effectiveness of aerial spraying to reduce human incidence of EEE and WNV
        - History of the science of EEE (including on the cycles of EEE)
        - What is known about efficacy of Anvil 10+10?
        - Could the public learn more about the risk/benefit ratios of chemical treatments?
        - Information that would enable municipalities to develop alternative mosquito management plans for the opt-out of SRMCB spraying program
        - Information about effects to neighboring properties for spraying and mosquito control on private property
        - Impact of CO2 in attracting mosquitoes
    - In some cases, although science may exist, there exists an opportunity to aggregate that information for the public's use
        - History of mosquitoes in the U.S., prior to organized control
        - Incidence of mosquito-borne illness around the world, and how MA fits into a worldwide issue
        - Information on mosquito control pesticide products over time, pertaining to the comment made that products have been designed to become more specific to mosquitoes, with an ultimate goal of smallest possible impact on environment and non-target organisms
        - Information on the impact of mosquito control on the habitats of arguably affected organisms
- Mosquito control structure
    - Requests for additional support
        - Comment on more support for mosquito control districts, including administrative and budget-related
        - Comment on need for additional resources to manage risk levels (in response to a town in which there was a EEE death two summers ago)
        - Comment that a particular town does not participate in an MCD due to costs of membership
        - Comment to explore possibility of additional resources through the federal SMASH Act (Strengthening Mosquito Abatement for Safety and Health Act;

supports state mosquito control programs), noted that bill is going through appropriations process
    - Comment on improved distribution of and coordination of services across MA
    - Concern over lack of choice over services provided by the mosquito control districts
        - Comment requesting ability to customize services received by the MCDs
        - Comments on lack of control over spraying by the MCD, on certain MCD policy on filling for exclusions, in particular
    - Comment that spraying may not be the best use of funding
    - Proposal to make changes to agencies and their roles coordinating with each other, to prevent delays, costs, overlooked regulations and laws
- Concern for oversight over publicly available pesticides and oversight of private mosquito control companies
    - Comment that homeowners are able to purchase pesticides over the counter, which could be better regulated
    - Comment that private pesticide companies are allowed to use pesticides on yards and properties - may use them without regard to bees/pollinators or boundary markers and may conduct daytime spraying
    - Requested that task force review gaps in regulations and laws that may exist for private applications

List of Individuals Providing Oral Comments

First and Last Name	Affiliation or Job Title
Gabrielle Sakolsky	Chair, Pesticide Environmental Stewardship Committee, American Mosquito Control Association; Superintendent, Cape Cod Mosquito Control
Gary Menin Sr	Elected Member - Sterling Board of Health
Laura Harrington	Professor of Entomology and Director of the Northeast Regional Center for Excellence in Vector-borne Diseases, Cornell University
Brendhan Zubricki	Essex Town Administrator
Christopher Horton	Superintendent Berkshire MCP
Gerald Clarke, Sc. D.	Chairperson, Board of Health, Town of Dover; Chairperson Water Resource Committee
Jeanne Galloway	Commissioner, Pioneer Valley Mosquito Control District
David Brown	American Mosquito Control Association - Technical Advisor
Bill Murphy	Director of Public Health
Betsy Kovacs	Heath Board of Health Chairman
Charles Lubelczyk	Vice President, Northeast Mosquito Control Association
Roberta Flashman	Ashby Conservation Commission
Barbara Katzenberg	Town of Lexington, Town Meeting Member and Conservation Land Steward
Kimberley King-Cavicchi	Adreanna's Mom
Jane Alessandra	Montague Opt Out
Patti Page	Gloucester Opt Out Initiative
David Tapscott	Board of Health/MVP Core Team
Marcella Stasa	Concerned citizen with health concerns
Bill Pula	Chairman Pelham Board of Health
Cathleen Drinan	Community Liaison for Plymouth County Mosquito Control Project
Richard Seelig	Pelham Democratic Town Committee
Thomas Trainor	Member, Sherborn MA Groundwater Protection Committee
Don Ogden	The Enviro Show producer & co-host
Brenda Davies	Zero Waste Amherst member
Laura Oxley	Boylston resident
Joe Kurland	Select Board Member, Colrain
Elizabeth Kuzdeba	Chair, Leyden BOH
Stephanie Gelfan	Individual homeowner
Wayne Miller	The Beverly Farms - President
Dorothy McGlincy	Executive Director, Massachusetts Association of Conservation Commission
Kristen Healy	Associate Professor, Louisiana State University
Michael Lavery	Select Board Member
Zywia Chadzynska	Resident of Acton
John Farnsworth	Lancaster BOH Chair
Katherine Holden	Member BoH, Personal Chef, Homesteader
Gail Hassett	Board of Health
Kyla Bennett	Science Policy Advisor, Public Employees for Environmental Responsibility
Nicholas Venti	Leverett Board of Health

<u>Mosquito Control Task Force Listening Session #2</u>
Summary of Oral Comments
February 10, 2022; 4:00-6:00pm

The purpose of the listening session was to accept public comment on the Mosquito Control for the Twenty-First Century Task Force subcommittee draft recommendations for comprehensive reform of the commonwealth's mosquito control system. This session was held remotely and was recorded for distribution to task force members and to post on the task force webpage.

Attendees signed up to speak at the listening session and were called on in the order in which they signed up. It was requested that comments be limited to three minutes. Attendees who signed up to speak but were not immediately present were given a second opportunity. Written comments pertaining to this session were accepted through February 14, 2022, at 5:00 p.m.

The listening session commenced at 4:00pm. The Executive Office of Energy and Environmental Affairs Undersecretary of Environmental Policy and Climate Resilience and Chair of the Mosquito Control for the Twenty-First Century Task Force, Bethany Card, provided an introduction, presented a series of background slides and guidelines for the session, and then opened the public comment period at 4:08pm.

The Mosquito Control for the Twenty-First Century Task Force received oral comments from 30 separate individuals. There were 235 attendees (est.) in the session, including task force members and Commonwealth of MA employees.

The listening session concluded at 6:00pm.

Summary of Oral Comments

The following notes summarize oral comments provided by listening session participants.

- Pesticide use in mosquito control: several commenters expressed concern over use of pesticides in mosquito control
    - General
        - Commenter requested limiting the use of pesticides whenever possible
        - Comment that indication of pesticide safety by pesticide manufacturers does not mean that pesticides are safe
        - Comment expressing frustration that local pesticide spraying activities do not take place with enough notice or outreach to community residents
        - Commenter expressed concern that recommendations come from a pro-pesticide viewpoint. Commenter indicated that the recommendations do not use the term "organic" and that chemically synthetic pesticides should not be a component of the mosquito control program
        - Commenter expressed concern over use of pesticides in the outer Cape Area, and its impact on businesses and health
    - Private application of pesticides: three commenters expressed concern over private application of pesticides and private applicators' use of pesticides, with requests that this issue be reviewed and addressed by the task force
        - Comment that private mosquito spraying should be tightly regulated and that the task force should explore closing loopholes about frequency of private spraying on properties
        - Support for creation of online reporting system to view data on private applicators, for analysis in order to understand the problems and to make recommendations to improve private interventions
        - General interest in more oversight over private application of pesticides
    - Preventative measures: multiple comments expressed interest in preventative efforts vs. reactive efforts like spraying to control mosquito populations
        - Encouragement for treatment as early in mosquito life cycles as possible
        - Call to focus on prevention of mosquitoes vs. killing of mosquitoes
    - Efficacy: comments noted importance of efficacy assessment and implementation of mosquito control measures that prioritize efficacy
        - Commenter noted a need to conduct tests before and after spray events
        - Commenter noted that mosquito control programs should do a better job of specifically targeting mosquitoes with the viruses that cause public health issues
        - Multiple comments called for establishment of thresholds for spraying, informed by efficacy measures
    - PFAS: Comments urged strong action against products containing PFAS and increased oversight efforts
    - Spraying of pesticides: several comments indicated strong opposition to aerial spraying and general opposition to localized spraying
        - Several comments strongly supported prohibition of aerial spraying

        - One commenter indicated that although they don't have a certified organic farm, an aerial spraying application would eliminate their ability to sell their produce as organic
        - Commenter requested no broad spraying of pesticides
        - Commenter noted that spraying pesticides should be used as a last resort, and the decision should be based on an elevated disease risk and not nuisance control
        - Comment that truck-based application of pesticides should never be conducted due to everything beyond mosquitoes that come into contact with the applied pesticides
        - Comment that there are a lot of dense wetlands that harbor mosquito populations across the state, and spraying cannot penetrate the wetlands, which renders spraying not effective
        - Comment that the existing mosquito spraying program is in direct opposition to other state programs that aim to protect ecology
        - Comment indicating frustration that new residents of municipalities are allowed to log complaints that might result in spraying that affects others
        - Comment requesting to avoid blanket statements on ceasing use of airplane application of pesticides, with reasoning that a targeted aircraft application is necessary to reduce the mosquito population and might also reduce the need for additional ground-based application
    - Human health and ecological health
        - Commenter noted that protecting non-target species from pesticide application is critical
        - Comment that climate change is prompting a decline in backyard bird populations, a decline in monarch butterflies, and a decline in pollinating insects, and that pesticide use for mosquito control is significantly impacting these same populations
            - Commenter indicated that although property as excluded from the last MCD spray event, the individual still noticed the loss of bees in their yard
        - Commenter requested that task force recommendations reflect potential risk of exposure to pesticides on health
        - Commenter called on task force to consider risk/benefit profile of mosquito borne illness vs. widespread impact of pesticide use. Commenter's perspective was that the human risk of contracting mosquito-borne illness (EEE/WNV) is very low as compared to the harm caused by widespread pesticide use
        - Commenters called on task force to focus on public health and not on human comfort, and called on the task force to distinguish between nuisance versus disease mosquito management
        - Commenter indicated that mosquito management needs to move away from chemical controls and towards ecological methods
        - Pollinators: multiple comments expressed interest in eliminating or minimizing use of pesticides, in support of pollinators

            - Three commenters expressed concern over well-being of all pollinators in MA and throughout the country, including native pollinators
            - Comment requesting that beekeepers who sell honey should have their bee yards exempted from spraying
            - Comment that pesticides that are least toxic to pollinators should be used
            - Comment that pesticides are contributing to decline in pollinators across the country
            - Comment that we should restrain from interactions that kill mosquitoes because large ecosystems that include pollinators take a lot of time to resettle
            - Comment that bee hives should be monitored before, during, and after truck-based spraying to assess impacts
        - Vulnerable populations: multiple comments expressed concern over impact of pesticide use on vulnerable populations
            - Commenter discussed first responders and others that have been chemically injured and marginalized and requested that the task force give additional focus to these populations and requested that task force view NOFA's presentation on the topic
            - Commenter identified that there are published studies that correlate impact of pesticide exposure to exacerbated health effects to the chemically sensitive community (will share links in written comments); noted that chemically sensitive community is substantive and has been increasing
            - Call for task force members to pay attention to the impacts of pesticides on vulnerable populations, because even low-level exposure to pesticides can be harmful, and there are a lot of health issues that could be exacerbated by mosquito control chemicals
                - Commenter described multiple pesticide poisoning experiences, and called on task force to consider experiences of individuals like commenter that endure impacts
            - Call for the task force to consider more balanced perspectives on impacts to vulnerable populations, because there are studies to support perspectives that are not currently being utilized in task force decision making
- Ecological mosquito control efforts
    - Several commenters expressed general support for ecological approach to management of mosquitoes
        - Call on mosquito control programming to shift away from chemical management to ecological management structure that prioritizes use of preventative measures
        - Commenter indicated cautious optimism with the recommendations as framed now

        - Comment supporting expansion of ecological efforts to solve problems in an environmentally friendly way
        - Comment that mosquito control practices should first account for the local environment
    - Two commenters indicated evidence that application of garlic oil on their properties has worked in mosquito prevention
    - Request for mosquito control applications that are favorable to honeybees
    - Commenter suggested planting gardens to support increased pollinator populations
    - Comment that mosquitoes are not a problem and that natural systems should be able to effectively control the populations; noted that mosquitoes are a food source
    - Support for low impact development techniques to reduce flooding potential, that leads to standing water
    - Multiple comments supporting reduction of standing water, including implementation of the runnelling technique to reduce standing water as a means of limiting coastal salt marsh mosquito habitat, and support for ditch remediation because it is low technology, low impact, and low risk
- Local Engagement/Education: several comments called for more communication and better communication with local residents
    - Commenters indicated concern over existing public notification systems (particularly for spraying) as being not consistent enough or predictable enough for residents – especially for beekeepers
    - Comment that local engagement is important to educate residents and in order to improve implementation of new systems
    - Call on task force to support development of creative ways to engage the public
    - Support development of tools for municipalities to use to educate community as to how to reduce mosquito populations
    - Comment that local engagement should include outreach to the media, in order for the media to provide good science-based information to the public
- Policy Structure
    - Multiple comments expressed support for repeal and replace of M.G.L. 252, including a replacement of the SRB, and restructured oversight board
        - Included a call for additional experts on the board
        - Included a call for inclusion of independent experts on the new oversight board
    - Multiple comments indicated concern that proposed policy structure would eliminate or minimize local control of mosquito control, and that this was not an acceptable outcome
        - Commenter noted that different parts of the state's mosquito control organizations operate very differently and should continue to conduct mosquito control based on local wants and needs
        - Commenter noted that other public comments implied that more statewide control was the best mechanism in which to increase ecological mosquito control mechanisms, and strongly disagreed with the notion that more statewide control would result in that outcome

    - Commenter indicated that if funding is sourced from municipalities, that the local mosquito control organizations should be the decision makers for use of those funds
    - Commenter called on task force to consider mechanisms to improve the regulatory structure for projects that focus on preventative management of mosquitoes, including installation of runnels and restoration of tidal hydrogeology
        - Request to remove regulatory hurdles to make permitting process easier
- Baseline services and menu-based approach
    - Multiple comments indicated support for provision of baseline mosquito control services to all municipalities, including monitoring and education and other ecological-based mechanisms
    - Multiple comments indicated support for a menu-based approach that prioritizes community choice
        - One commenter indicated that this approach may promote more participation in MCD processes
        - Support for residential opt-out of services
- Mosquito Management Plan: multiple comments indicated that that the development of a statewide mosquito management plan will allow for consistency in administration and allow for implementation of efficacy measures
- Integrated Pest Management: multiple comments indicated support for IPM strategy under discussion by the task force
- Utilization of science-based resources to inform recommendations: commenter discussed lack of mosquito control experts participating in discussion and recommended that task force reach out to CDC to review CDC-published materials on mosquito control, and suggested the task force look at the American Mosquito Control Association documents and best management practices when developing IPM procedures
- Agriculture: commenter expressed concern about the narrowness of the definition of organic agriculture with regard to mosquito control, and noted there are many small farms that would benefit from the same permissions and protected status option, as certified organic farms. Commenter recommended that the task force find a way to widen the definition to include the small farms that don't have the resources to become certified
- Mosquito spraying opt-out
    - Program to enable municipalities to opt-out of SRMCB mosquito control spraying for 2022
        - Request for setting a reasonable deadline so that municipalities have time to prepare for approval by Local Boards of Health and Select Boards
        - Concern that towns don't have the time or funding or resources to go through a lengthy process by which to opt-out, and noted that the state must account for the costs of the process
        - Three commenters described experience going through opt-out process last year – expressed frustration that towns were denied based upon regional risk levels because some towns are geographically different than in the location in which infected mosquitoes are found, and felt that opt-out applications were justified enough to warrant approval
    - Mosquito spraying opt-out into the future

        - Commenters expressed interest in maintaining local option for opt-out
        - Ability to opt out is very important and that municipalities need to be able to make independent decisions
        - Support for development of online system to track opt-outs
- Support for existing mosquito control efforts
    - Multiple comments expressed appreciation for Cape Cod Mosquito Control Project (CCMCP) in managing mosquito populations
        - Comment that CCMCP has worked well with local entities to respond to infestations in order to put good practices to use, particularly when individual control efforts like repellent were not sufficient to those partaking in the outdoors
        - Comment that CCMCP has done a great job with ditch clean-out
        - Comment that CCMCP is responsive and responsible and locally supported and controlled, particularly in implementation of best management practices
    - Multiple comments expressed appreciation for cooperation between Bristol County Mosquito Control District and local organizations – particularly to commend successful project to construct runnels for management of standing water, and to commend staff for great work and willingness to share learned practices with other MCDs
- Other/Misc.
    - Commenter indicated that draft recommendations are moving in the right direction
    - Support for the work of the task force and the work that has been proposed
    - Comment that many of the comments made in this listening session are similar to comments from the many in the first listening session, and that many of these concerns are being ignored by the task force
    - Comment that cautioned about oversimplification of the recommendations as presented during the listening session, and prompted listening session attendees to read the detailed draft recommendations
    - Commenter suggested that task force members listen to the legislative briefing that was given on 1/26
    - Support for wider use of personal protective measures
    - Call for inclusion of organic farmers, beekeepers, or the chemically injured on the task force and in task force dialogue
    - Call for implementation of innovative partnerships with local land trusts/town on synergistic projects to improve ecological health and reduce mosquito breeding habitat

List of Individuals Providing Oral Comments

Note: Information included below is self-identified by the registrant

First and Last Name	Job Title and Organization	Affiliation	Subcommittee to which comments pertain
Patti Page	Mortillaro Lobster - Industry Liaison	Business	Local Engagement;Policy Structure;Pesticide Selection;Best Practices;
Barry McLaughlin	General Manager	Business	Best Practices;Pesticide Selection;Policy Structure;Local Engagement;
Sharon Dunn	writer	Private Citizen	Local Engagement;
Louise Hetzler	Self-employed music teacher	Private Citizen	Best Practices;
David Brown	Technical Advisor American Mosquito Control Association	NGO/Community Group/Non-profit	Best Practices;
Skip Del Vaglio	Old Drone Apiary at Frog Cottage Master Beekeeper	Private Citizen	Pesticide Selection;
Mary Duane	President Massachusetts Beekeepers association	Private Citizen	Best Practices;
Heidi Dollard		NGO/Community Group/Non-profit	Best Practices;
Jean Lemieux	President of the Massachusetts Association for the Chemically Injured	NGO/Community Group/Non-profit	Best Practices;Local Engagement;
Drew Toher	Beyond Pesticides	NGO/Community Group/Non-profit	Local Engagement;Best Practices;Pesticide Selection;Policy Structure;
Gayle Fee	President, Board of Governors, Chequessett Club, Wellfleet	Business	Local Engagement;
Marcella Stasa		Not listed or N/A	Best Practices;Pesticide Selection;Policy Structure;Local Engagement;
Nancy Rea		Private Citizen	Best Practices;Pesticide Selection;Policy Structure;Local Engagement;
Cathy Kristofferson	Conservation Commission member	Government	Best Practices;
Roberta Flashman	Ashby Conservation Commission - Commissioner	Agriculture	Best Practices;
Dorothy McGlincy	Executive Director, Massachusetts Association of Conservation Commissions	NGO/Community Group/Non-profit	Best Practices;Pesticide Selection;Policy Structure;Local Engagement;
Kym Doherty		Private Citizen	Best Practices;Pesticide Selection;
Michael Farley		Private Citizen	Best Practices;Local Engagement;Pesticide Selection;

Ellen Fine	Director, Community Equitability Group-Resiliency Gardens Project Healthy Yards, Needham	NGO/Community Group/Non-profit	Best Practices;Local Engagement;Pesticide Selection;Policy Structure;
J. Gregory Milne	Chairman -- Board of Commissioners -- Cape Cod Mosquito Control Project	MCD	Best Practices;Policy Structure;Local Engagement;Pesticide Selection;
Lisa Rigsby	Resident	Private Citizen	Best Practices;Pesticide Selection;Policy Structure;Local Engagement;
Rachel Jakuba	Vice President for Bay Science, Buzzards Bay Coalition	NGO/Community Group/Non-profit	Best Practices;Local Engagement;
Charles Sumner	Interim Town Administrator Town of Wellfleet	Government	Policy Structure;Local Engagement;
Kevin Robbins		Private Citizen	Best Practices;
Chris Doyle		Private Citizen	Best Practices;Policy Structure;
Wenley Ferguson	Director of Habitat Restoration	NGO/Community Group/Non-profit	Best Practices;
Victoria Antonino		Private Citizen	Best Practices;Local Engagement;Policy Structure;
Gillian Budine	Town of Wendell, Selectboard member	Government	Policy Structure;Local Engagement;Best Practices;
Jeanne Mooney		Private Citizen	Local Engagement;
Danielle Perry	Coastal Resilience Program Director and Mass Audubon	NGO/Community Group/Non-profit	Best Practices;

PUBLIC COMMENTS RECEIVED

August 2020 to May 3, 2021

Testimony Task Force 21st Century 2021 0503

Thank you for allowing public comment in the 21st century 5/3/21 meeting.

Mosquito control is an important health issue. We should not ignore arbovirus; instead, we should address this intelligently and safely.

Massachusetts legislation passed in June 2020, expanding the State's authority to conduct mosquito spraying, aerially or by truck, historically using Anvil 10+10, in every town across the state, is deeply flawed. **This law should be revoked.**

In the meeting, I was discouraged that the first several speakers, state representatives, claimed the MA mosquito control policy is safe and effective. The entire SE of MA has a 'forever' problem due to the PFAS in Anvil 10+10 containers. Aerial spraying, by the states' own data, is ineffective. Anvil's own literature states, "Toxic to aquatic organisms; highly toxic to bees… Runoff from treated areas into water may be hazardous… (On human health it is) largely untested; Harmful if absorbed through the skin, and an OSHA defined 'Hazardous Chemical'".

The state speakers led me to lose confidence that the Task Force of the 21st Century is fair-minded, that you will follow the science of 2021, not of 1950.

It seemed all speakers except those from the state, Louisiana EPA's Dr. Kristen Healy, and the woman from Halifax, MA, who tragically lost her daughter, were against the current program, especially of aerial spray. This task force must listen to the people.

We live in a country where more than 583,000 deaths have occurred in one year from Covid, yet to mandate wearing masks or taking vaccinations is argued as an infringement upon constitutional rights. Yet, Massachusetts mandates it can fly a plane and drop a "Hazardous Chemical" on citizens' property without their consent. This is a gross violation of our rights.

<u>Minimal changes to new law if not revoked</u>

As many stated, at a minimum, the law should be amended immediately.

Opt Out should be changed to Opt In.

The May 15, 2021 deadline for municipalities to opt out must be extended. Massachusetts must simultaneously provide a broad public outreach program to advertise to the public that this law exists.

Every town that applies to opt out must be accepted. The law gives the state the opportunity to refuse opt out applications based on vague parameters. Should the state be unsatisfied with a municipality's opt out application, the state and the town must work together until a satisfactory solution has been found, allowing the town to opt out.

Problems with Anvil 10+10 Aerial & Ground Spraying

Aerial and truck spraying are the most toxic and least effective methods. Mass State record document the ineffectiveness of aerial spraying. 2019 data reports half of spray events killed zero mosquitos. There is no evidence of disease reduction.

Anvil is a pyrethroid and resistance to pyrethroids is well documented in all insect groups serving as disease vectors. Reproduction by even one pesticide-resistant mosquito can result in hundreds of resistant offspring who then create an entire population with genetic pesticide resistance, often in a matter of weeks.

Public health officials agree spraying can never bring disease risk to zero. Reducing the mosquito population to zero is not only impossible, it would disrupt the food chain with untold negative consequences. Thus, the number one line of defense against mosquito borne illness is personal protection.

The most effective mosquito control is to reduce breeding habitat, monitor mosquitos, target specific sites, and educate the public.

A biodiverse ecosystem provides effective mosquito control. Studies show that widespread pesticides imperil this by impacting non-target species, and in the long run, increase the mosquito population.

In the middle of an insect apocalypse, with pollinator populations catastrophically dropping, in 2020, the NEMCD alone in 2020 used 3356 pounds of solid treatments and 2382 gallons (19,826 pounds) of spray treatments. 2020 cases included WNV: 1 pool tested positive, no equine cases, no human cases and EEE: No positive pool tests, no equine cases, no human cases. This cost $1.7 million. This is in no way a proportionate response.

Under the new law, wildlife management areas, watershed land, private beekeepers, and some rare species habitats are **not** excluded, despite that Anvil's literature states, "Toxic to aquatic organisms; highly toxic to bees… Runoff from treated areas into water may be hazardous."

On human health, Anvil's label states it is "largely untested; Harmful if absorbed through the skin, and an OSHA defined 'Hazardous Chemical'". The EPA states Anvil is a suspected carcinogen, a GI and liver toxicant. NIOSH states Anvil is additionally a suspected kidney and neuro toxicant.

The NIH published, "Recent research suggests that even low levels of pesticide exposure can affect young children's neurological and behavioral development. Children are vulnerable to … pesticides, and therefore require special research and policy attention."

Suggested changes in policy

Aerial and truck adulticide spraying of Anvil 10 + 10 should never be used, even in a declared health state of emergency, until it can be proven safe and effective. It is an

unsound, ineffective, dangerous, and expensive step that should not be included in integrated mosquito control. The IPM solution must be targeted and minimally impact the environment, animal, and human health.

The IPM solution used in MA must use the European Precautionary Principle as a guideline.

While aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine how far from sensitive sites the planes fly. Reports of drift up to 8 miles exist, in 0 MPH wind, due to inversions, yet margins for aerial spray in MA is measured in barely hundreds of feet.

BTIs must be thoroughly vetted, including the reported danger to the lobster population.

ALL ingredients, including inert, must be listed so product safety may be evaluated if a pesticide is to be used or sold in Massachusetts.

Public education on the private use of pesticides must be grossly expanded and revised so the public understands the risks as well as the rewards. Private pesticide application must be better litigated.

Change Needed for Personal Property Exemption, Effective Immediately

Effective immediately, individual property owner requests for exclusion from spraying should not be nullified in a declared health state of emergency, including an area calculated for pesticide drift.

First, as stated above, this is a violation of individual rights. Also, many people who request this exclusion have done this specifically for medical reasons.

EEE has had 110 cases since 1938 and WNV 67 cases since 2000. To exacerbate the medical conditions of possibly hundreds of thousands of citizens for the sake of under 200 people over decades is to allow a cure far worse than the disease.

There are many illnesses exacerbated by Anvil 10+10. I will mention but 3.

Asthma. Sumithrin, an ingredient in Anvil has been documented to cause asthmatic responses in those exposed. The CDC estimates that about nine people in the US die from asthma each day. 8% adults in the US have asthma, or approximately 551 thousand Massachusetts citizens. To exacerbate the medical conditions of over 550,000 people, to risk their lives in a fatal asthma attack, for the sake of under 200 people over decades is unsound.

Multiple Chemical Sensitivity (MCS). On 5/11/20, Jean LeMieux, President of the Massachusetts Association for the Chemically Injured, Inc., testified on H4650. She wrote, "MCS appears to afflict 4%-6% of the population, 15% to 30% of the … population perceive themselves as… sensitive... Some… reached the point of being disabled…" Ms. LeMieux

referred to Drs. Ashford and Miller, who noted, “Pesticide exposures are associated with the recurrence of symptoms… And can worsen their level of sensitivity/intolerance… Existing standards of OSHA, EPA, and state agencies do not protect those individuals already sensitized.”

To summarize, minimally 4% of MA population is ~275,000 people with MCS affected by aerial spraying with no veto power, in a “Health Emergency” where less than 200 people have had WNV/EEE over decades.

Autism & Developmental Delays: Scientific studies statistically connect pesticides to autism and childhood brain disorders. In upper-state NY, a 2017 study published in *Frontiers in Pediatrics* found children who lived where aerial pyrethroid pesticide spraying occurred each summer were 37% more likely to have autism or documented developmental delay. Anvil is a pyrethroid pesticide. And yet, pregnant women cannot opt out their personal property in a declared state of emergency.

The MA law nullifying individual property exemptions during state emergencies must be voided.

Thank you for the opportunity to write my feedback.

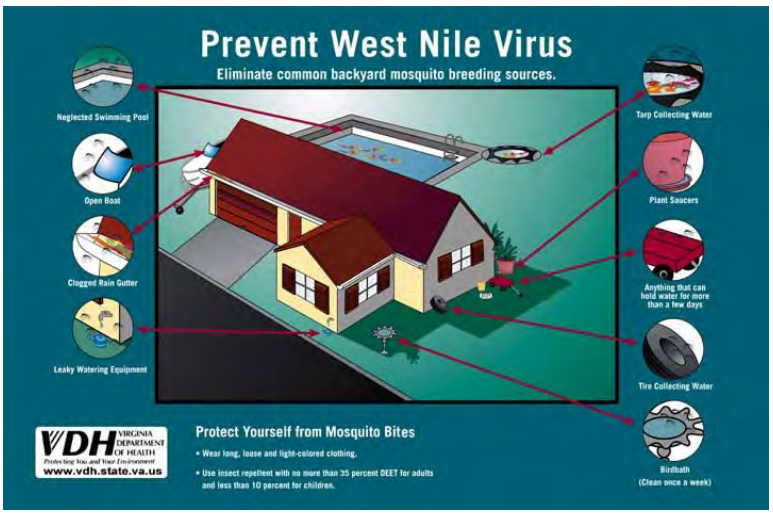
* Please note that every fact above has been sourced; these are available upon request.

Comments provided to the Massachusetts Mosquito Control Task Force
May 3, 2021
Michele Colopy, Executive Director, LEAD for Pollinators, Inc.

We Can Protect Human Health and Honey Bees

Concerned for public health, municipalities spray insecticides and larvicides through communities to control mosquitoes. While some communities have pro-active programs to alleviate standing water and other breeding areas for mosquitos, the preferred practice is to spray and fog our cities, roadways, ditches, and waterways with pesticides. Of the typical pesticides used for mosquito control, most are applied by trucks spraying the product as it drives down your street, or along the side of the road. A random perusal of various state and city mosquito abatement processes conflict as to the "best time" to apply the pesticides in order to cause the least harm to honey bees and native pollinators. Sadly, far too many of the extension documents and state guidelines claim bees are not active after 3 p.m. which is just blatantly false. Honey bees and native pollinators will forage blooming plants until the sun sets. To fully protect honey bees and native pollinators from mosquito control pesticides, the pesticide should only be applied when it is dark: the sun has set and the street lights are lit. Dark is dark, not twilight, not sunset: dark.

Community Controls



Some cities like Boulder, Colorado, post actions residents can take to protect themselves from mosquitos, and how to reduce the use of pesticides on their person and property. These mitigation measures reduce the habitat for mosquitoes, thereby reducing the exposure to mosquitoes. Personal mitigation measures require individuals to take action to protect themselves. County mosquito control spray

programs may expand the prophylactic use of pesticides across more of the ecosystem. Individuals should remove trash and standing water on their own property in order to protect themselves and others from mosquitos, and to protect pollinators from mosquito control products.

Bee kills across the U.S. in agriculture are typically due to tank mixes and prophylactic use of pesticides on plants grown from pesticide coated seeds. In urban and suburban areas, mosquito abatement practices are causing unnecessary bee kills. Some cities offer beekeepers the opportunity to "opt-out" of mosquito spray applications near their property. However, the "opt-out" process is sometimes cumbersome. One Massachusetts community went from 400 people opting out, to only 100 opting out the following year due to a change in the application process requiring certified letters to be sent to the local government. Other communities provide a sign to you to post at each end of your property so county workers will not spray between the signs (your property frontage). However, they continue to spray before and after your property signs. Even if a beekeeper opts out of having their property sprayed for mosquitoes, pesticides drift onto water and blooming plants. Not all mosquito control products have a short residual toxicity, and can last more than eight hours on the blooming plants and in water. The next day when bees drink from a puddle or stream, or collect nectar from a bloom containing a mosquito control pesticide, the honey bee or native pollinator may die.

Water for Honey Bees

Many mosquito control products speak to addressing mosquito larvae in water, and then imply the pesticides in the water will not harm bees. Bees do drink water. So, if a pesticide lingers in the water, bees will encounter the pesticide there, as well as on blossoms, and guttation droplets on plants. Far too many mosquito control documents ignore the fact bees drink water, and mislead the

*Pathways of **pesticide** movement in the hydrologic cycle from www.pubs.usgs.gov*

pesticide applicator stating bees stay in their hives after 3 p.m. Those two issues lead to great harm being caused to honey bees and native pollinators. Every living creature needs clean, pesticide free water to drink; and "busy as a bee" means on warm, hot days they work from sunrise to sunset, and they need water to cool the hive, and themselves.

A study of mosquito control products effect upon coastal water showed how pesticides and the water can interact to create a more toxic situation. Research published in the Archives of Environmental Contamination and Toxicology *"determined that lower oxygen levels in water, known as hypoxia, and increased acidification actually increased how toxic some of the pesticides were."*[1] This study of mosquito control products along coastal areas found differences in sensitivity *"between chemicals, species, and life stages"* in clams and oysters due to drift overspray or unintentional drift into coastal waters of mosquito control pesticides. While this study showed decreased swimming activity after four days in oysters, and decreased growth in clams and oysters after 21 days, the researchers calculated a low-level risk to oysters and clams *"from application of these pesticides for mosquito control."* The researchers did note *"The more extreme climate conditions caused increased pesticide toxicity."*[2] *While* this study is of clams and oysters, the changes in the water and the pesticides show an increased toxicity. Honey bees live near coastal areas, and drink from the waters draining into these estuaries.

The U.S. Geological Survey Water Science School exclaims water plays an important role in the movement of pesticides as *"it is one of the main ways that pesticides are transported from the areas where they are applied to other locations, where they may cause health problems."* As many larvicides are applied to water, where mosquitos breed we create a toxic water source for our honey bees and native pollinators. *"Pesticides can reach water-bearing aquifers below ground from applications onto crop fields, seepage of contaminated surface water, accidental spills and leaks, improper disposal, and even through injection waste materials into wells."* states the USGS Water Science School. As many bee kills are the result of tank mixes of herbicides, insecticides, and fungicides, "*Some pesticides have had a designated maximum Contaminant Limit (MCL) in drinking water set by the U.S. Environmental Protection Agency (EPA), but many have not. Also, the effect of combining more than one pesticide in drinking water might be different than the effects of each individual pesticide alone. It is another situation where we don't have sufficient scientific data to draw reliable conclusions."*[3]

Fifty percent of the U.S. population *"obtains its drinking water from groundwater sources and as much as 95% of the population in agricultural areas uses groundwater as its source of drinking water."* [4] The Safe Drinking Water Act sets standards for drinking water in public water supplies. *"Private water supplies are not monitored or regulated by this Act."*[5] The consumer or well owner is responsible for monitoring their own water supply for contaminants. We, therefore must be aware of the drinking supply for our honey bees.

Mosquito Control Pesticides

Typical mosquito control products listed on local government mosquito control websites are: methoprene, Bti, Bsp, temephos, sumithrin, malathion, permethrin, and chlorpyrifos. Not all of these products are applied individually, and even if they are, they are always mixed with surfactants or oils, and "other ingredients" for which there is little information.

<u>Summary of some mosquito control pesticides:</u>

1. methoprene- (affects the development of egg/larva) moderately to highly toxic to fish and crustaceans; relatively non-toxic to birds; low toxicity to adult bees, but bee larvae may be more sensitive.
2. Bti (Bacillus Thuringiensis) - not toxic to bees, has been used in hives for control of wax moth. However, "very high concentrations of B.t. var. tenebrionis, which is used against beetles such as the Colorado potato beetle, reduced longevity of honey bee adults but did not cause disease." Initial studies also did not show results of Bti upon native pollinators such as butterflies.
3. Bsp (Bacillus sphaericus) -not toxic to bees
4. temephos- highly toxic to bees, aquatic organisms, and is moderately to highly toxic to birds.
5. sumithrin - extremely toxic to bees, aquatic life, and poisonous to cats and dogs.
6. malathion - highly toxic to bees, and to freshwater and estuarine aquatic organisms, moderately toxic to birds.
7. permethrin - toxic to fish and bees

8. chlorpyrifos - very highly toxic to bees, birds, freshwater fish and invertebrate

"Insecticide toxicity is generally measured using acute contact toxicity values LD50 – the exposure level that causes 50% of the population exposed to die. Toxicity thresholds are generally set at:

- highly toxic (acute LD50 < 2µg/bee)
- moderately toxic (acute LD50 2 - 10.99µg/bee)
- slightly toxic (acute LD50 11 - 100µg/bee)
- nontoxic (acute LD50 > 100µg/bee) to adult bees." [6]

One mosquito control product is a combination of prallethrin, Sumithrin® and piperonyl butoxide. The label clearly states: *"This pesticide is highly 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. 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 beyond the body of 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 to or allow drift onto blooming crops or weeds when bees are visiting the treatment area, except when applications are made to prevent or control a threat to public and/or animal health determined by a state, tribal or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes, or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort."*[7]

Even in the above label's environmental hazard statement the two exceptions: to apply to bloom, and to water, are allowed with full understanding honey bees and native pollinators will be killed. A public health emergency allows for the exceptions to occur and application of the product made against the label protections for pollinators. Communities must ensure they are truly protecting human health. If diseases are <u>not</u> found in trapped and tested mosquitoes, then

tax dollars should not be wasted applying a pesticide when it is not needed. Prophylactic use of pesticides is as problematic as prophylactic use of pharmaceutical drugs. Regular use depletes their ability to work.

We can protect human health, and we can protect honey bees. Beekeepers should be able to protect their honey bees from mosquito control products. As a community we should protect our native pollinators. As individuals we can be proactive to protect our property from mosquitoes, and protect our honey bees and pollinators from the adverse impact of mosquito abatements. If a health risk is established, a short residual toxicity mosquito control product should only be applied after the sun has set, when it is dark. Only then will honey bees and native pollinators have a chance to survive mosquito abatements.

[1] National Oceanic and Atmospheric Administration, "NOAA scientists find mosquito control pesticide use in coastal areas poses low risk to juvenile oyster, hard clams, Climate stressors, however, increase risk to shellfish," June 9, 2014, http://www.noaanews.noaa.gov/stories2014/20140609_mosquitoinsecticide.html

[2] Ibid

[3] Pesticide in Groundwater, The USGS Water Science School, http://water.usgs.gov/edu/pesticidesgw.html

[4] Pesticide Residues in Drinking Water, Extoxnet FAQs http://extoxnet.orst.edu/faqs/safedrink/pest.htm

[5] Ibid

[6] Pollinator protection requirements for Section 18 Emergency Exemptions and Section 24(c) special local need registration in Washington State; Registration Services Program Pesticide Management Division Washington State Dept. of Agriculture, Dec 2006; Hunt, G.J.; Using honey bees in pollination Purdue University, May 2000

[7] Sample Label for Duel action adulticide http://www.cabq.gov/environmentalhealth/documents/duet_label.pdf

Other resources:

Pesticides Used in Mosquito Control from the National Pesticide Information Center
http://npic.orst.edu/pest/mosquito/mosqcides.html

Water Quality Assessment and Total Maximum Daily Loads Information http://www.epa.gov/waters/ir/index.html

Patti Page
Gloucester Opt-Out Initiative
Gloucester, MA
pattiannpage@gmail.com

May 4, 2021

Mosquito Task Force for the 21st Century – May 3, 2021
Public Listening Session Comments

The greatest shift produced by the 2020 arbovirus mitigation legislation (H-4851, H-2757) is the loss of choice. This edict assigns automatic enrollment and prescribes an onerous process for municipalities to remove themselves from under State control. Residents are no longer protected by right.
This provision should be rescinded, amended or otherwise reversed. An OPT-IN policy, as was the case prior to 2020, versus such Opt-Out foolery needs to be reinstated.

The Opt-Out applications deadline of May 15th needs to be extended. The State notice of March 19th, 2021 is clearly not adequate time to provide appropriate communication and outreach. Further municipalities need added time to carry out necessary political actions.

Additionally, Municipalities would like some assurance from EEA if applications are deemed deficient, the State would work with municipalities towards acceptably compliant Opt-Out programs, rather than denial without any opportunity for resubmission.

From the NEMCD 2020 annual report: NEMCD 2020 annual report

2020 $1.7 million spent in the NE district
solid treatments - 3356 pounds
spray treatments - 2382 gallons (19,826 pounds)

2020 Cases:
Wnv - 1 pool tested positive, no equine cases, no human cases
EEE - no positive pool tests, no equine cases, no human cases

What is the cost/benefit analysis?
There is a lot of money spent, a ton - literally 11.6 tons of pesticides
All this for 1 positive pool test? Seems like overkill (pun intended)

IPEN – Chemical pollution along with climate change are chief reasons for fish declines. Pesticides – some bio-accumulate in aquatic organisms, destroy habitat and food supplies aquatic organisms depend on, including insects. Run-off from agriculture, golf courses, sports field, parks and residential properties, and spray drift are all direct sources.

The scientific phylum Arthropoda includes mosquitos, lobsters, shrimp, snails and crabs. What kills a mosquito kills a lobster and these other aquatic life.

Gloucester is the largest landing port of lobsters in the State. Our marshlands and coastal eel grass beds are ecosystems of nursery areas for aquatic life. Our economic stability depends on healthy, environmentally beneficial policies and practices by local and State agencies.

According to CDC & EPA, spraying of pesticides for adult mosquitoes is the least effective and most environmentally damaging method to control mosquito diseases. The blanket spraying of synthetic pesticides is a threat to the integrity of insect biodiversity and ecosystem health that our farms and gardens rely upon.

Synthetic pyrethroids are not natural. Synthetic chemical formulations contain other "inert" ingredients. Neither EPA nor Mass test for negative health consequences or environmental impacts of mixtures of active and inert chemical ingredients.
Please define the "gold standard" of pesticide use as we heard referenced in the May 3rd Public Listening Session.

Chemicals are known to elevate risk factors to our immune and respiratory systems. Some cause lung irritation, asthmatic responses; others magnify the toxicity of synthetic pyrethoids.
The injury caused by chemicals to people, wildlife and the environment is the true public health crisis and by far out numbers the cases of arbovirus related illness.

Governments around the world must urgently acknowledge the environmental, economic and public health degradation caused by chemical pollution and act on scientific evidence to develop policy and lead communities to totally re-think how chemicals are used.

Regenerative approaches are urgently required to stop further pollution and move towards restoration practices. Boulder, Colorado's innovative Ecological Mosquito Management plan that protects people and the environment is the gold standard model we should implement moving forward. Pesticide reduction to elimination of use is the only acceptable response.

The Commonwealth of Massachusetts should be a leader in the best practices to protect mankind, wildlife and the environment. Please allow 21st Century environmental science guide the recommendations of the Mosquito Task Force.

CAPE COD COOPERATIVE EXTENSION

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www.capecodextension.org

April 26, 2021

To Whom it May Concern:

I have worked as the Barnstable County Floodplain Specialist for six years. As part of this work, I help the towns manage a program aimed at reducing flooding and flood risk, called the Community Rating System (CRS). When towns participate in this program, they earn a discount on flood insurance for their residents and businesses in exchange for actions that improve flood safety within their borders.

Nine towns participate in this program, and all of these towns get credit for the stormwater management that the Cape Cod Mosquito Control Project (CCMCP) effectively practices. Because CCMCP seeks out standing water and eliminates obstructions to the flow of that water, the Community Rating System provides credit to these towns as part of their stormwater management practices, keeping drainage channels clear.

As part of the required documentation for CRS credit, I work with Mosquito Control every year to document the stormwater management that they implement. Annually, we submit their Integrated Pest Management procedures, which detail how CCMCP manage obstructions to flow to reduce the likelihood of standing water where mosquitos can thrive and to serve the dual purpose of eliminating flooding. We also submit the CCMCP's authorizing regulations to ensure they have the right to do the stormwater management work in each respective town; their field work definitions; a map of sites managed by CCMCP; and annual reports of areas that have been checked and cleared.

Thanks to CCMCP's work contributing to stormwater management and flood reduction, all nine towns that participate in the Community Rating System get credit toward flood insurance discounts.

Please reach out if you have any questions.

Sincerely,

Shannon Hulst
Floodplain Specialist / Deputy Director
shannon.hulst@barnstbalecounty.org
508-375-6952

To the members of the Mosquito Control Task Force:

Our planet is undergoing an alarming decline in insect populations, which has been well publicized in the past few years. This by itself should have us scrambling to determine the causes and do whatever we can to address them, but it also represents a devastating loss of pollinators for agricultural crops and wild plants, and is having cascading effects on the birds, reptiles, amphibians, mammals, and fish that directly or indirectly depend on insects for food. Which is essentially all of them.

In the midst of this crisis, the Commonwealth of Massachusetts is engaged in a mosquito control program that involves spraying pesticides from trucks, airplanes, and helicopters. These chemicals are in no way specific to mosquitoes: they are deadly to all insects, and their use is being directed at wetlands, our most biologically productive ecosystems. The pesticide droplet size is supposedly "small enough to reduce the likelihood of harm to larger insects," but this statement is far from a guarantee that larger insects won't be harmed, and ignores the fact that the vast majority of insects are as small as, or smaller than, mosquitoes.

Several years ago I arrived at a conservation area in southeastern Massachusetts to conduct botanical fieldwork, and was shocked to encounter a sign at the entrance warning that this supposedly protected land—in a state that supposedly has some of the strongest environmental laws in the country—was subject to periodic aerial spraying. Imagine my horror when I learned recently that the entire state is now being subjected to this madness by default, and that towns that don't like it have to "opt out" and come up with an alternative plan in an impossibly short time frame.

Even larvicides that are said to be specific to mosquitoes are in fact deadly to larvae of other, related flies that (like mosquitoes, I'm sorry to say) are an important part of the food web. Their use may be appropriate in some circumstances, such as in small human-made puddles and pools where most of the larvae present are mosquitoes. But blanketing the landscape with totally nonspecific poisons (or frankly, any poisons) is completely unacceptable, and as the Commonwealth's own website admits, it does not eliminate the risk of humans contracting mosquito-borne viruses. People need to take steps to avoid being bitten by mosquitoes whether or not these pesticides have been used, and these steps should be the Task Force's focus. And it wouldn't hurt to include some public education about how to have a healthy lifestyle and boost the immune system.

One would think that 60 years after the publication of *Silent Spring*, we would have learned its lessons and would be heeding its warnings. I urge you to think ecologically, consider unintended consequences, and do what you can to reverse the present assault on all that is not human.

Thank you for your time,

Charley Eiseman
Naturalist & Author
Northfield, MA

It is the mites because . . .

> *"But even if the varroa mite problem were solved today, this would not by itself solve all of the problems facing honey bees and beekeepers,"* Dr. Jeff Pettis, Research Leader USDA -Agricultural Research Service [1]

The latest research on mites, and another avenue[2] to control them is welcomed. However, the recent research [3] and surveys[4,5] and the current "Mite-A-thon" obfuscates the real cause of the bee health crisis: their toxic environment.

Pic from wikipedia.org

The focus on varroa mites, as the sole pest to honey bees, detracts from a primary factor affecting the health of honey bees: pesticides. The varroa mite has been in the USA since the mid-1980's. Beginning in 2005 bees started dying in unprecedented numbers. As the cause had not yet been identified, it was called "colony collapse disorder (CCD)." While many researchers have correlated the ecosystem accumulation of systemic and conventional pesticides with abnormal bee mortality, too many continue to discount bee toxic pesticides, including those pesticides clearly defined as "bee toxic." But in this bee health crisis "*There is relatively little incentive for university entomologists to consider complex real-world issues such as the cumulative effects of toxic synergies that involve low doses of neonicotinoids, the way beekeepers might*."[6]

Research across a number of years shows the residues of crop protection pesticides in bee hives creating sub-lethal and behavioral altering environmental levels of toxins within the "house, nursery, and food pantry" of the bee hive. When honey bees eat sub-lethal levels of toxins, when they feed it to their young, when it contaminates the pollen and nectar they bring into the hive, or the pesticides leach across frames contaminating pesticide-free pollen or nectar, of course the bees are susceptible to the effects of the varroa mite. A weakened immune system is typically attacked on many fronts. With honey bees the varroa mite is just the final straw in the colonies' health. "It is the mites because" of the accumulation of pesticide residues on the bee forage, as well as pesticide residues in and on water.

Pesticide exposure alters the varroa- to-bee-relationship allowing varroa to overrun the hive. Using Bee Informed Partnerships' treatment threshold of no more than three varroa mites per hundred bees the composite sample of a bee yard is just under or at the threshold. When the bees are subjected to an insecticide spray, if it is in the city, maybe mosquito abatement, or in agriculture, aphid spraying on a blooming crop; a relatively "light hit" of pesticides may only kill half of the bees. What happens to the varroa to bee ratio then? Every varroa mite in a brood cell raising its next generation are happily feeding on healthy bee larva. In a matter of hours, the mite to bee ratio may double. Research is showing however, that varroa mites exposed to sub-lethal levels of these same pesticides go into hyper breeding mode. Several weeks out the hive is in trouble with a varroa mite overload; *but it is mites because, not because of mites.*

It is simply mis-information to continue to promote a single cause, varroa mites, and therefore imply a single solution. It is mis-information to the food consumer, agricultural stakeholders,

and policy makers to ignore other factors simply because it makes for convenient data collection. Dr. Pettis provided additional insights in his 2014 testimony stating, "The loss of honey bees may also reflect a much larger issue of general pollinator declines, with honey bees acting as an indicator species." An insightful examination of the honey bee health crisis is presented in *Vanishing Bees* by S. Suryanarayanan and D.L. Kleinman, who suggest "that forms of knowledge and ignorance about honey bee toxicology are a result of methodological choices that do not necessarily reflect the ground realities of commercial pollination or the social lives of honey bees."[7]

Research has shown toxicities of individual pesticides increase when they are mixed together.[9,10,11] Research shows there are high residue levels of pesticides in the hive that kill queen bees, and larvae.[9,12,13, 21, 23, 24] Pesticide labels clearly state which products are toxic to bees, and other non-target organisms.[11] Systemic neonicotinoid pesticides are labeled as bee toxic, and the research shows the toxicity of these pesticides from direct, residue, and cumulative impacts upon bees.[21, 22, 24] Research shows bees exposed to low levels of pesticides have higher varroa mite loads.[25] These higher mite loads compromise the honey bees immune system resulting in higher virus and Nosema loads.[10] Some pesticides turn off the honey bees' ability to detoxify pesticides.[26] Research is showing fungicides are problematic for honey bee health.[9,14,15] Research shows that pesticides applied to a crop, or yard, or public lands, drift.[16,17,18,19,20] If the pesticides drift onto pollinator habitat then that forage is now a contaminated food source for honey bees and other pollinators. But it makes for difficult research when examining the impact of all of these factors on bee health. And yet, we must. Bee health is not failing just because of the varroa mites; varroa mites are taking advantage of a hive already suffering a weakened immune system as they interact in their ecosystem. *"It is the mites, because. . . "*

Recent national honey bee loss numbers paint an incomplete picture of bee health, and discount the efforts that beekeepers are engaged in to keep their bees alive. The constant requeening of hives, splitting hives in the fall, keeping bees out of their spring buildup areas until the risk of planting pesticide coated corn seed is done, and the continual feeding of bees as if they were feedlot livestock.

We must ensure research is complete, encompasses the bees' real-world, and involves /acknowledges beekeepers in the research design, development, and implementation. Honey bee health will only improve when we acknowledge the complete experience of the honey bee and the beekeeper.

The factors impacting honey bee health are pesticides, pests, pathogens, and poor forage. To continue the fallacy of a single pest is misleading. When examining bee health one cannot simply assess one pest, but every single factor, and the cumulative effects of all of the factors. Bee health is not a singular assessment—as samplers of the environment, honey bees are telling

us the accumulation of pesticides make the immune system weaker, reduce the reproductive ability of the queen and drone bees, make bees forgetful, accelerate the hive tasks of worker bees, and affect the next generation of bees. It is irresponsible to ignore the impact of pesticides upon honey bees, when so many of the chemicals are registered, and sold with federal pesticide labels clearly stating "this product is toxic to honey bees." (For example see this pesticide label http://www.syngenta-us.com/currentlabel.aspx?productid=721) Assessing the health of bees from the four factors impacting their health: pesticide exposure, bee pests and diseases, and loss of forage may difficult for scientists, we cannot continue to do research simply on one pest of the bee thinking that is the only problem. We cannot continue to ignore the other factors affecting bee health that allow the varroa mite to have such an impact. The intense use of pesticides contributes significantly to the weakened health of honey bees exacerbating the impact of the varroa mite. If it is just varroa mites impacting the health of honey bees, what has caused the decline in Monarch butterflies?

[1] Dr. Jeff Pettis, Research Leader USDA -Agricultural Research Service in his Testimony before the House Committee on Agriculture Subcommittee on Horticulture, Research, Biotechnology and Foreign Agriculture, April 29, 2014, (https://agriculture.house.gov/sites/republicans.agriculture.house.gov/files/pdf/hearings/pettis140428.pdf)

[2] **Varroa mites – bees' archenemies – have genetic holes in their armor, Layne Cameron, Zachary Huang, http://msutoday.msu.edu/news/2017/varroa-mites-bees-archenemies-have-genetic-holes-in-their-armor/**

[3] **Varroa Mite Researchers Talk High Infestations in Bee Colonies, Carol Miller, Growing Produce, http://www.growingproduce.com/vegetables/varroa-researchers-talk-high-infestations/**

[4] **Bee Informed Partnership Survey, https://beeinformed.org/2017/05/25/2016-2017-loss-results-thank-you-to-all-survey-participants/**

[5] NASS Survey of Honey bee colonies numbers, https://www.usda.gov/nass/PUBS/TODAYRPT/hcny0817.pdf

[6] **Vanishing Bees: Science, Politics, and Honeybee Health, Sainath Suryanarayanan, Daniel Lee Kleinman,2016, Rutgers University Press, page 10, https://www.rutgersuniversitypress.org/vanishing-bees/9780813574585**

[7] Ibid, page 9

[8] Insect pollinators contribute $29 billion to U.S. farm income, Krishna Ramanujan, May 22, 2012, http://news.cornell.edu/stories/2012/05/insect-pollinators-contribute-29b-us-farm-income

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Read more at: https://phys.org/news/2016-09-high-pesticides-colonies-linked-honey.html#jCp

To the members of the 21st Century Mosquito Task Force,

Thank you for this opportunity to comment as you develop the state's next policy on mosquito management.

As a resident of a community that has not been part of a Mosquito Control District (and therefore never under threat of aerial spraying), we were surprised by the change in policy this year, and feel that the communication with town officials and the public has been inadequate. Although our community is at fairly low risk for EEE and WNV, (and, I hope, for the state's aerial spraying program), it is unclear what the thresholds are, and our town is left scrambling to opt out with minimal time to develop our own plan—the timing is mismatched with towns' budget planning processes. If the new rules had been made clear over the winter, our planning process would have been able to be more thorough and complete.

Our community would like to rely on the state for some services, such as monitoring and surveillance, assistance with habitat manipulation (restoring biodiversity, and eliminating manmade breeding sites), and possibly targeted larviciding with consultation with the local Board of Health and Conservation Commission. We are prepared to assist the state with more robust public education and outreach about personal responsibility for standing water in yards, and personal protective measures. But we are absolutely outraged by the possibility of adulticiding, particularly aerial applications.

My family grows much of our food using organic techniques (although we are not certified organic) relying on native pollinators, and enjoying good health in part due to the lack of toxic chemicals in our food. This is a large part of why we live in a remote, biodiverse area. The idea of pesticides raining down on our land is quite horrifying. My father is a beekeeper, and my husband is an entomologist. Even if mosquito spraying occurs in evening hours and beekeepers can close up hives *with adequate advance notice*, there are many native insects that rest in exposed locations, resulting in unintended 'bycatch'. This is simply unacceptable when we know we're living in an era of insect decline, and that intact biodiversity is important for human and planetary health.

I support the recommendations of the MassQuito Coalition and ask that you make their recommendations part of the new policy.

Thank you,

Julia Blyth
276 Old Wendell Rd.
Northfield, MA 01360

May 5, 2021

Electronic Submittal: https://www.mass.gov/forms/comments-for-the-mosquito-control-task-force
Mosquito Control for the Twenty-First Century Task Force
Massachusetts Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Seeking Balance in Mosquito Control, Public Listening Session, Written Comments

Dear Mosquito Control Task Force:

Thank you for the opportunity to submit comments on mosquito control in Massachusetts. My name is Dorothy McGlincy. I am submitting these comments as a resident of Massachusetts, rather than as my professional capacity as Executive Director for the Massachusetts Association of Conservation Commissions (MACC). I am a Licensed Site Professional (LSP) in Massachusetts and a New Hampshire Professional Geologist with more than 30 years of environmental experience working to protect groundwater for the state of Maryland, and investigating groundwater, surface water, and soil contamination as an environmental consultant throughout the United States. I am concerned that Massachusetts' approach to mosquito control has not moved into the 21st Century, and the process is out of balance with the natural world.

I am writing to ask the Mosquito Control Task Force to:

- Minimize the use of pesticides for mosquito control, especially for aerial spraying to minimize impacts on other flying insects and pollinators;
- Prior to use, all mosquito control pesticides should be analyzed to ensure there are no per- and polyfluoroalkyl substances (PFAS). Pesticide Safety Data Sheets often document more than 80% inert chemicals, but the Commonwealth has no understanding what is in these materials, without sampling, prior to use. We need to seek a balance with the use of chemicals, prevention of severe diseases to humans, *as well as* impacts to biodiversity and the world around us.
- Allow municipalities to Opt-In, rather than Opt-Out of the Mosquito spraying process;
- Provide an extension for municipalities if the Opt-Out option is maintained for municipalities;
- Provide additional communication about these issues to local Boards of Health, Select Boards, Conservation Commissions, and Massachusetts Municipal Association.

In my consulting experience, I have worked to cleanup PCBs, VOCs, metals, and hydrocarbon releases at USEPA Superfund sites, Massachusetts Contingency Plan (MCP) sites, and on large and small remediation projects. In Massachusetts, the cleanups are conducted to ensure that remaining contaminant levels pose no significant risk to human health or the environment. As my experience as an LSP and environmental consultant has shown, there are exceedingly high costs for environmental investigations and cleanups. We are learning about the "forever" compounds, per- and polyfluoroalkyl substances (PFAS), and other emerging contaminants are being discovered in drinking water supplies throughout Massachusetts, and the cleanup of PFAS in drinking water and groundwater is exceedingly expensive.

Until last year, we did not know that PFAS compounds were present in Anvil 10+10, used for aerial mosquito spraying, but an environmental non-profit sampled Anvil 10+10 for PFAS, and shared the

information with the state and other organizations. MassDEP and the USEPA sampled the pesticide and confirmed the presence of PFAS compounds. I urge the Task Force to prioritize preventative measures (such as eliminating breeding sites), work to manage mosquito populations using non-toxic approaches, eliminate aerial spraying for mosquitos, and use the least toxic pesticide product available, rather than aerial spraying of pesticides for mosquito control.

Pesticides used for mosquito control are toxic to fish, bees, and many other beneficial organisms, and also present dangers to public health, especially for the very young, older people, and those with conditions such as asthma, chemical sensitivity, or impaired immune systems. The recent discovery of PFAS in mosquito control pesticides is further cause for concern, and this issue got far deeper than just packaging. As the Commonwealth undertakes efforts to lead on climate action including recognizing the role of healthy wetlands and waterways in climate resiliency, MACC urges that the state truly move mosquito control into the 21st century. This should include a shift away from routine use of pesticides and toward greater emphasis on public education, personal protection, and restoration of diverse wetland systems through dam removals, culvert upgrades, and other projects that enhance habitat for fish and other mosquito predators.

It is also vital that communities and landowners have choices in how their lands are managed, and that the new system provide "opt-in" services rather than limited "opt-out" provisions that leave them exposed to unwanted chemical treatments. People's efforts to grow food without pesticides, and to support pollinators around their homes and communities, should not be undermined by intrusive chemical applications.

Thank you for the opportunity to submit comments.

Sincerely,

Dorothy, A. McGlincy, LSP, PG
62 Prospect Road
Andover, MA 01810

Comment To: Massachusetts Mosquito Task Force
From: Michele Colopy, Executive Director, LEAD for Pollinators, Inc.

How to protect bees from pesticides

The University of Georgia, College of Agricultural and Environmental Sciences states

> *"For fruit or nut bearing crops, pollination can be a grower's last chance to increase yield. All post pollination inputs, whether growth regulators, herbicides, fungicides, or insecticides, are generally designed not to increase yield but to conserve losses."*

AgriCultures Network writes in "Managing for higher yields," "Less than 5% of the world's insects are harmful to humans or crops." And yet, "95% of insects killed by blanket applications of pesticides are not pests and may even be beneficial."

The *National Strategy to Promote the Health of Honey Bees and Other Pollinators* published in May 2015 stated "exposure to pesticides" is one of pollinator stressors; and, "It is the misuse and overuse of these pesticides that leads to adverse ecological and human health consequences."

Jim Jones, Assistant Administrator for EPA's Office of Chemical Safety and Pollution Prevention at the MP3 Symposium in March of this year stated, "unless we solve the bee health problem the heat will not come off pesticides."

G. Splevin has pointed out in his review in *Bee Culture* of "The Indispensable Honeybee" the detrimental effect upon bees from pesticides has <u>not</u> changed since 1973.

> *"The decline of beekeeping in the U.S. can be attributed to three specific problems—poor honey prices, pesticides, and limited bee pasture. The order in which the problems are rated will depend on where the beekeeper lives in the U.S. In some areas, it may just be one problem affecting the beekeeper and in other areas it might be a combination of all three."*

Pesticides are and have been a *documented* issue for beekeepers for more than forty years.

The short answer, the historic answer to protecting bees and native pollinators are best management practices advised by Agricultural Extension, Researchers, and State Dept.'s of Agriculture to prevent bee poisonings by pesticide exposure:

- Avoid spraying crops when they are in bloom
- Avoid spraying when the bees are most active
- Reduce pesticide drift
- Use less toxic compounds
- Avoid using pesticides that come in the form of dusts, wettable powders or micro-encapsulated pesticides
- Use pesticides with a low /short Residual Toxicity
- Use Integrated Pest Management (IPM) to decrease the overall number of pesticide applications

Numerous groups have educational, informational, "how-to" brochures, and pamphlets on how to protect pollinators from pesticides.

Insecticide application timing vital to protecting bees
https://ugaurbanag.com/insecticide-application-timing-vital-to-native-bee-conservation/

What Can Growers Do to Manage Risks to Honey Bees?
http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Environmental-Services/Consumer-Resources/Florida-Bee-Protection/Information-for-Growers

Pollinators: What you can do http://www.fws.gov/pollinators/pollinatorpages/yourhelp.html#pesticide

Protecting Honey Bees During Corn and Soybean Planting Season
http://articles.extension.org/pages/63369/protecting-honey-bees-during-corn-and-soybean-planting-season#.UwuS7Cg_MfE

Ten Ways to Protect Bees From Pesticides http://pollinatorstewardship.org/wp-content/uploads/2014/02/388-TenWaysToProtectBeesFromPesticides.pdf

Bee Aware: Protecting Pollinators from Pesticides http://pollinatorstewardship.org/wp-content/uploads/2014/02/Protecting-Pollinators-Nebraska.pdf

10 Steps for Responsible Pesticide Use
http://www.audubon.org/sites/default/files/documents/10_steps.pdf

Protecting Pollinators: Why and How Pesticide Applicators Can Help Them
http://www.pollinator.org/PDFs/NAPPC.pesticide.broch.Applicators17.pdf

These, and similar documents, have been in circulation for years if not decades. The only method by which we are continuing to kill pollinators with pesticides is the tool called "humans." Humans are not reading pesticide labels. Even though following the directions on a pesticide label is federal law, the victim of use or mis-use of pesticides must report the incident.

In far too many cases the "victim" (often the beekeeper) is investigated due to their bees dying from pesticide exposure.

The "environmental hazard statement" on pesticide labels clearly warns the pesticide user what non-target organisms, water, plants, or soil will be affected. The bee hazard statement on the label advises the pesticide user if the product harms bees.

EPA's role is to ensure pesticides *"do not pose any unreasonable risks to human health or the environment."*

Label directions manage potential risks.

Read the Label!!!!

- Active ingredient
- Signal words:
- Caution (lower toxicity products)
- Warning (medium toxicity products)
- Danger (highest toxicity products)

Information and picture from National Pesticide Information Center http://npic.orst.edu/index.html

However, not all pesticides are required to be tested on honey bees. Fungicides, Insect Growth Regulators (IGRs), and herbicides, according to research and beekeeper experience, are showing significant impact upon honey bees. Yet these pesticides carry no or few bee hazard warnings. Fungicides in pollen are part of the sub-lethal risk cup of pesticides being brought into the hive, and stored in their food supply.

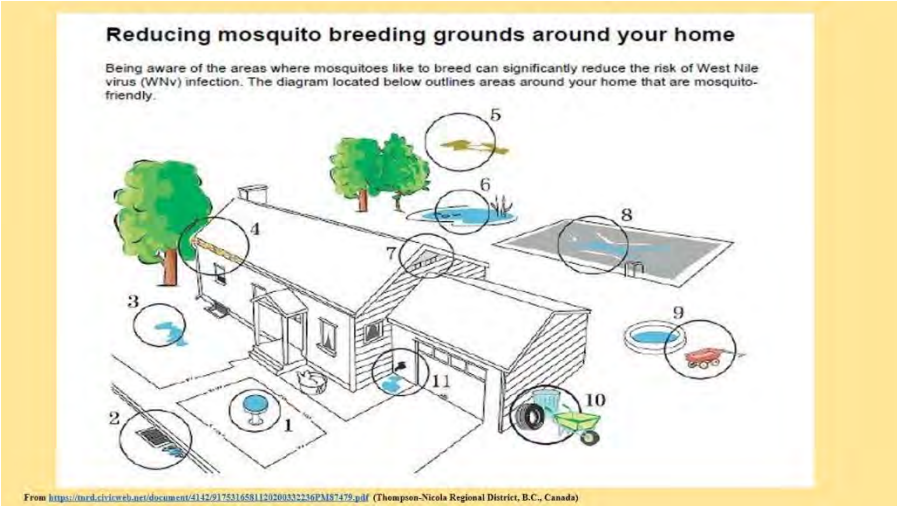
Research has also shown that pesticides on pollen do not stay in a capped cell, but move across the wax foundation to taint other stored pollen. Research shows "increased probability of Nosema infection in bees that consumed pollen with a higher fungicide load . . ." and exposure to fungicides makes "bees more sensitive to acaricides . . . "

Additionally, the synergism of pesticides in pollen and wax create all new toxicities. A tank mix of pesticides upon crops can be just as deadly to bees as the synergized mix of pesticide residues in the stored pollen. Recent research by the US Geological Survey found nineteen current-use pesticides and degradates were detected in thirty-nine out of fifty-four samples of *native* bees. This study found where land uses overlap, there is unintentional pesticide exposure. *"Previous toxicological studies have shown that the chemicals do not have to kill the bees to have an adverse effect at the levels of exposure documented here."*

As states work on their Pollinator Protection Plans stakeholders should review already published guidelines for protecting pollinators from pesticides. Stakeholders should acknowledge the value

of pollination to crop yield. No matter whether the crops are pollinator *dependent* or pollinator *attractive* crops: crop yield increases! For example, when blueberries were pollinated by more than one species of bees there was an increase of $311 worth of yield per acre in North Carolina. Of the honey bees, bumble bees, southeastern blueberry bees, carpenter bees, and small native bees North Carolina State University calculates the *"benefit of each group (of bee) to be approximately $1.42 million worth of yield each year."*

From a North Carolina teacher's guide of the history of pesticides "*Agriculture has always included different means of pest control. Pest control can include things like: crop rotation, weed control, and treatment with chemicals to control disease and insects. Many of these practices have existed since agricultural practices began. The use of chemicals to control weeds, diseases and plant-destroying insects increased with the introduction of DDT in 1939."* A 1960 public service ad for pesticide safety at this link http://media.lib.ncsu.edu/libVideo/view/838/ is dated, but shows the same problem we have today. *Humans need to learn to use pesticides safely.*



Agricultural pesticides are not the only source of exposure to honey bees, it is also mosquito control products, and lawn and garden pesticides. We can mitigate the health risks from mosquitos by reducing their habitat. Beekeepers need to talk to and work with their local mosquito control districts to encourage them to implement best management practices that will protect pollinators and protect public health. If one cup of water can hold 1000 mosquito eggs, humans need to clean up their yards, remove standing water, and remove mosquito habitat. This mitigation will protect our bees, and reduce pesticide use.

Best Management Practices can protect pollinators, guiding stakeholders toward being responsible, respectful "neighbors." The actions of one person in one field with one pesticide application can affect their neighboring farm field, bee hive, and water. If I rent bees to pollinate

my crop, and I use pesticides killing the bees I paid good money to rent, I have wasted money renting bees, and I have reduced my crop yield, and the crop yield of the next pollinated crop. Most importantly, I have damaged the livelihood of the beekeeper, killing his livestock. If my crop is done blooming, and I need to control for pests in the field, but my neighbor's crop is in bloom, I need to work with my neighbor to protect my crop, and ensure he has a good fruit or nut set through pollination. I have options to use a short residual toxicity product applying it at night; I can spot treat the pest; I can determine when pollination has concluded on the neighboring crop, and control for pests after that time. As we develop pollinator protection plans there are options besides "moving honey bee hives," and sacrificing native pollinators. As these many guides clearly advise we can protect pollinators and protect crops; we can protect public health and protect our managed and native pollinators. The most important tool for protecting pollinators is humans.

Resources

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High Levels of Miticides and Agrochemicals in North American Apiaries: Implications for Honey Bee Health, Christopher A. Mullin mail, Maryann Frazier, James L. Frazier, Sara Ashcraft, Roger Simonds, Dennis vanEngelsdorp, Jeffery S. Pettis, Published: March 19, 2010, DOI: 10.1371/journal.pone.0009754 http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0009754

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Crop Pollination Exposes Honey Bees to Pesticides Which Alters Their Susceptibility to the Gut Pathogen *Nosema ceranae* http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0070182

"Enhancement of crop production through bee pollination," Orissa Review, Sept. 2010

"The importance of pollinators: Commercial fruit production in Minnesota," Katie Lee, Dept. of Entomology, Univ. of Minnesota

"Dept. of Agriculture and Food- bee pollination benefits for avocados," bulletin 4298, http//:archive.agric.wa.gov.au/PC_91826.html

"How far is world agriculture production likely to be threatened by pollinator declines?" Maria Pinke, Sustainable Development

"Wild pollinator habitats benefit agriculture," Cool Green Science, www.nature.org

"Farming with honey bees: Increasing agricultural yields through honeybee pollination," UH Bee Project 2009, University of Hawaii

"Native pollinators boost crop yields worldwide," Science News, March 1, 2013

"Functional group diversity of bee pollinators increases crop yield," Proceedings of the Royal Society B: Biological Sciences, Oct. 7, 2008

"More species of bees pollinate crops, making blueberry farms see increased yield," International Science Times, May 9, 2014

"Cotton yield indicators declined with increasing distance from bee sources . . . the study showed a "significant positive impact of supplemental honeybees on cotton yield."

"Impact of honey bee pollination activities on Bt cotton production in northern Alabama," Dept. of Plant and Soil, Alabama A & M University

"Managed honeybees increase onion seed yield and quality," http://www.lrrd.org/lrrd26/1/gebr26008.htm

"Lack of pollination due to insecticide use affects onion see yields," http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=5688

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"Pollination of soybean by honey bees," Brazilian Archives of Biology and Technology, Vol. 48, n. 1: pp. 31-36, January 2005

"Pollinator decline: US Agro-Socio-Economic impacts and responses," Journal of Natural and Environmental Sciences, 2013, 4 (1): 1-13.

"Pollinator: a grower's last chance to increase yields," The Univ. of Georgia, College of Agricultural and Environmental Sciences

"Managing for higher yields," AgriCultures Network, http://www.agriculturesnetwork.org/magazines/global/28-1-insects/managing-for-higher-yields

From a news series Bees on the Brink, "Natures' Dying Migrant Worker," by Josephine Marcotty, June 2014, www.startribune.com

2015 World Hunger and Poverty Facts and Statistics, World Hunger Education Service, http://www.worldhunger.org/articles/Learn/world%20hunger%20facts%202002.htm#Does_the_world_produce_enough_food_to_feed_everyone

Special Collections Research Center Teacher Resources: Lesson Guides: Pesticides: Pesticide Development and Use in North Carolina, **http://www.lib.ncsu.edu/specialcollections/learning-resources/pesticides.html**

To: Massachusetts Mosquito Control Task Force
May 3, 2021
Michele Colopy, Executive Director, LEAD for Pollinators, Inc.

Impact of Pesticides to Pollinators

The health demise of honey bees and native pollinators began before varroa mites. It began with mono-agriculture. It began with the love affair with lawns. It began with the unaware, over-use of pesticides. It began with the lack of concern about global pest and disease transmission through the introduction, intentional and non-intentional, of species from across oceans.

The media, who did not understand the factors impacting pollinator health, adopted the use of "three letters: CCD" to explain the unseasonal death of honey bee colonies. The pesticide industry, and policy makers, adopted the promotion of the "three letters," even though the pesticide product labels clearly state the products are toxic to bees, and other invertebrates . . . and birds and fish . . . and humans, depending on the product.

Whether it is 1948[1], 1973[2], 2013[3], or 2017[4] mono-agriculture and pesticides kill bees and their forage[5]. However, to be clear:

- insecticides, labelled bee toxic, kill bees;
- herbicides, which research is showing affect the memory and learning of bees, and therefore damage the super organism called the bee colony;
- fungicides, which are not tested on bees prior to EPA registration, but university research is showing are harmful to a bee colony;
- adjuvants, surfactants and "other ingredients" that accompany each insecticide, fungicide, and herbicide active ingredient are NOT tested by EPA prior to the product registration for their impact on anything; and,
- mixing any combination of insecticide, herbicide, or fungicide together creates all new chemistry, increasing the toxicity of the individual products and kills bees. [6]

There is no mystery to what is killing honey bees and native pollinators. Just like the long practiced misdirection that nicotine is not addictive, but when more chemicals are added to the tobacco the addiction, and detriment to health, increases. The tank mix of chemicals in and on the tobacco severely impact the health of the user (smoker), and those within breathing range of the user. We could refer to second hand smoke as "drift."

Just like second hand smoke, pesticides drift. When a pesticide is applied it does not stay put.[7] Pesticide drift, like second hand smoke, impacts the health of non-target plants and insects. Pesticide drift makes bee forage, blooming plants, toxic. Pesticide drift kills the forage on which bees need to feed to sustain themselves and the bee colony.

In a large-scale assessment of the distribution of glyphosate and AMPA in European agricultural soils, research found "*The presence of glyphosate and AMPA in agricultural soils may not only*

form a risk for soil health but also a potential risk of further spreading of these compounds across land, water, and air domains. Indeed, besides potential effects on local edaphic communities and on humans, that can be exposed to these substances by inhalation of contaminated dust particles, dermal contact, or ingestion of contaminated surface water, wind and water erosion have the potential to transport contaminants to all the environmental compartments: atmosphere, other soils and surface waters."

Insecticides meant to kill one pest, can drift and kill dozens of species of beneficial insects. Herbicides meant to suppress weeds in a field or roadside ditch, eradicate bee forage or drift onto bee forage making it toxic. Fungicides, not even tested for their impact on bees prior to EPA registration, when applied to blooming plants are carried back to the hive on the pollen and fed to the next generation of honey bees, killing them.

When any pesticide is injected into a plant, or coated onto a seed, the pesticide makes the plant toxic to insects. However, that pesticide does not stay put, and does not stay within the plant. The pesticide translocates into the pollen and nectar of the plant, the very food pollinators eat. The pesticide coated on the seed, injected or drenched into soil impacts ground dwelling beneficial insects. These same ground nesting bees, and soil organisms support the health of the plant, the root system of every plant, and help prevent soil erosion. Ground nesting bees, and other beneficial insects eat the pest insects, but only if the beneficial insects are allowed to live.

Our honey bees and native pollinators have been suffering since the introduction of pesticides-synthetic or natural. If you want to kill a soft-squishy insect you consider a "pest," you will also kill honey bees and other soft-squishy beneficial insects. No pesticide is "safe." All pesticides (insecticides, herbicides, fungicides) are meant to kill. It is the dose, the time of day, weather conditions, and method of application—all defined by the "directions for use" that are supposed to mitigate the risk to "non-target organisms" when pesticides are applied. In other words, it is how humans use the products; and we use them very poorly. But as the label clearly states under the *Important: Read Before Use* section, "All such risks shall be assumed by the user or buyer." [8]

There is no mystery to what is killing honey bees and native pollinators. Three letters, CCD, are just an easy answer for the media, a misdirection from the Environmental Hazard / Bee Hazard statement on pesticide labels, and denial of humans who want an easy excuse to misuse and over apply any pesticide. Insects matter in the health, sustainability, and viability of the ecosystem. Just because you do not like insects does not mean they have no value. Even if we eradicated mosquitoes, the disease vectors that adapted to live in the guts of mosquitoes would find another critter to help it spread, to help it live. Want to get rid of mosquitoes near you? Get rid of standing, stagnant water. One cup of water holds a thousand mosquito eggs.[9] Pesticides which kill mosquitos, kill honey bees and native pollinators when they are sprayed on standing water, on blooming plants, and when bees are active.

There is no mystery to what is killing honey bees and native pollinators. There are solutions, but they involve humans changing their behavior. Like the regulation of cigarette smoking, pesticides too are being regulated to less and less places to use them, and less people who can use them. Corporations and communities are beginning to make change driven by consumer

demand for change: (this is not a complete list, for more information go to https://www.ncel.net/neonicotinoids/)

Scotts Pollinator Promise http://pollinatorstewardship.org/index.php/pollinator-promise/

Kroger releases new policy to limit bee-killing pesticides on garden plants, https://foe.org/news/kroger-releases-new-policy-limit-bee-killing-pesticides-garden-plants/

Woolworths to stop selling pesticide linked to global bee decline
Australian grocery giant will join Bunnings to withdraw Yates Confidor from sale
https://www.theguardian.com/environment/2018/jan/23/woolworths-to-stop-selling-pesticide-linked-to-global-bee-decline

Costco releases new policy to limit toxic pesticides to protect pollinators
http://pollinatorstewardship.org/wp-content/uploads/2018/06/June-22-2018-Pollinator-News.pdf

European Union expands ban of three neonicotinoid pesticides, http://www.sciencemag.org/news/2018/04/european-union-expands-ban-three-neonicotinoid-pesticides

Eugene's Neonic Ban First of Its Kind in Nation, http://www.beyondtoxics.org/work/save-oregons-bees/accomplishments-of-the-save-oregons-bees-campaign/eugenes-neonic-ban-first-of-its-kind-in-nation/

Maryland Will Be The First U.S. State To Ban Bee-Killing Pesticides For Consumer Use, https://www.collective-evolution.com/2017/07/20/maryland-will-be-the-first-u-s-state-to-ban-bee-killing-pesticides-for-consumer-use/

Portland, ME Becomes an Organic City, Banning Toxic Pesticides on Public and Private Property http://pollinatorstewardship.org/wp-content/uploads/2018/05/Feb.-2-2018-newsltr.pdf

What is killing honey bees and native pollinators? Direct applications of pesticides to pollinators, pesticides causing the loss of, or making forage toxic, and pests, and pathogens to pollinators the effects of all exacerbated by each other, are eradicating these beneficial insects. All living creatures have another creature trying to kill it, eat it, or use it as a host—even humans. Long before varroa mites were introduced to the USA, pollinators still were impacted severely by loss of forage, and pesticide exposure. We knew the loss of forage was a factor, we knew the industrialization of agriculture was a factor impacting our bees, and our soil health. We knew the free pollination services provided by native pollinators was being reduced as pesticide use increased and bee forage was reduced. Research is now showing the impact of the bee pest, the varroa mite, increases when the honey bees are exposed to pesticides.[10] The mite has a greater impact because of the pesticides. Only when humans admit they have a problem, and that their actions are causing the problem, and humans change their actions, will health and

balance be restored to pollinators and the agricultural ecosystem. There is no mystery to what is killing honey bees and native pollinators: it is us.

Additional data and resources cited:

[1] ***Soil Conservation and Honey Bees Circa 1948*** *http://pollinatorstewardship.org/wp-content/uploads/2018/07/May-15-2016-Pollinator-News.pdf*

[2] **The Indispensable Honey Bee,** *https://www.beeculture.com/?s=Splevin)*

[3] **Colony Collapse Disorder Is a Fraud: Pesticides Cause Bee Die-Offs** *http://www.greenmedinfo.com/blog/colony-collapse-disorder-fraud-pesticides-cause-bee-die-offs)*

[4,10] **It's the mites because. . .** *http://pollinatorstewardship.org/wp-content/uploads/2018/06/Sept.-29-2017-Pollinator-News.pdf)*

[5] **Pollinator Habitat Is Disappearing At Rates Usually Reserved For Descriptions Of Amazon Rain Deforestation,** *https://www.beeculture.com/glyphosate/*

[6] **Spray Toxicity and Risk Potential of 42 Commonly Used Formulations of Row Crop Pesticides to Adult Honey Bees (Hymenoptera: Apidae)** https://academic.oup.com/jee/article-abstract/108/6/2640/2379815?redirectedFrom=fulltext

[7] **Dicamba Drift Puts Natural Areas at Risk, Environmental Groups Warn** https://www.agriculture.com/crops/dicamba-drift-puts-natural-areas-at-risk-environmental-groups-warn

[8] **Allegiance-FL label**, https://assets.greenbook.net/18-15-46-07-03-2018-Allegiance_FL_Seed1_Treatment_Fungicide_Label.pdf

[9] **We Can Protect Public Health and Protect Pollinators. Bees shouldn't be sprayed, and beekeepers should control mosquitoes**, https://www.beeculture.com/catch-the-buzz-we-can-protect-public-health-and-protect-pollinators-bees-shouldnt-be-sprayed-and-beekeepers-should-control-mosquitoes/)

New Science Shows Bee-Killing Pesticides Are Unnecessary on Most Farms *https://civileats.com/2018/03/28/new-science-shows-bee-killing-pesticides-are-unnecessary-on-most-farms/*

Year-round presence of neonicotinoid insecticides in tributaries to the Great Lakes, USA *https://www.sciencedirect.com/science/article/pii/S0269749117344962*

Distribution of Glyphosate and Aminomethylphosphonic Acid (AMPA) in Agricultural Topsoils of the European Union,
https://www.sciencedirect.com/science/article/pii/S0048969717327973

State medical society voices concern over pesticides' safety
http://www.telegram.com/news/20180514/state-medical-society-voices-concern-over-pesticides-safety

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http://pollinatorstewardship.org/wp-content/uploads/2018/05/March-16-2018-PSC-newsletter.pdf

Farms could slash pesticide use without losses, research reveals,
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Avoid Tank Mixing Insecticides with Fungicides, Not all fungal diseases can be controlled by fungicides, https://www.beeculture.com/the-pollinator-stewardship-council-feb-2015/

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Massachusetts Association for the Chemically Injured, Inc.
P.O. Box 754, Andover, MA 01810 (978) 681-5117 Fax (978) 686-0745
Email: MACIMCS@aol.com Website: MACI-MCS.org

May 5, 2021

RE: Public Comment by the Massachusetts Association for the Chemically Injured under the Listening Session for Public Comment before the Task Force on Mosquito Control for the Twenty-First Century

Dear Chair Daniel Sieger, Vice Chair Kevin Cranston and members of the Task Force,

On behalf of the members of the Massachusetts Association for the Chemically Injured (MACI), a volunteer, non-profit statewide support, education and referral organization for people with Multiple Chemical Sensitivity (MCS), I am writing to provide comment to the Task Force specific to the health effects that pesticide exposures can have on the chemically sensitive community and the necessity of honoring a request for exclusions and opt outs from Aerial Spraying and Wide Area Pesticides Application even under a declared state of public health emergency. May 11, 2020 written Testimony was submitted by the Massachusetts Association for the Chemically Injured on H.4650 *An Act to mitigate arbovirus in the Commonwealth.* Our organization had followed the progression of the revisions and changes made to the original bill to its final form that passed the state legislature and became law.

MACI was founded in 1994 to assist those who suffer with multiple chemical sensitivity (MCS), a condition in which a person develops greatly increased sensitivity to chemicals and other irritants. Reactions to environmental exposures can affect many organ systems and result in multiple symptoms such as headaches, burning of the eyes, nose, throat, dizziness, respiratory difficulties, gastrointestional problems, fatigue, musculo-skeletal pain, cardiac problems, and neurological deficits such as memory loss, concentration difficulties and cognitive dysfunction. The frequency of environmentally triggered illnesses – including those from pesticide exposures - is escalating, as is the toll on human health, health care costs and employers' costs. Findings of several population surveys indicate that while MCS appears to afflict 4% to 6% of the population, 15% to 30% of the general population perceive themselves as "especially" or "unusually" sensitive to common everyday chemicals. Some people who had mild sensitivities for many years report a gradual progression of symptom severity and impairment until they reached the point of being disabled.

The Massachusetts Association for the Chemically Injured has been following pesticide issues in the Commonwealth for many years. MACI submitted testimony in 1997 and 1999 on the Children and Families Protection Act and this past legislative session our organization provided testimony on several pesticide bills which took steps to protect the health of children and adults by reducing public exposure to pesticides. [H.791 *An Act Relative to Improving Pesticide Protections for Massachusetts School Children,* S.447/H.776 *An Act empowering towns and cities to protect residents and the environment from harmful pesticides*. S.499 *An Act relative to the use of glyphosate on public lands,* H.792 *An Act relative to the prohibition of the transfer or use of glyphosate in the Commonwealth*] As you can see from the above listing our organization has been following and commenting on pesticide issues in our Commonwealth for

many years. M.G.L. c.252, Section 2A, unfortunately, invokes a movement toward the unrestricted spraying of pesticides raising serious health concerns. I urge this Task Force to seriously address how the risk of *arbovirus* in the Commonwealth can be mitigated through non-chemical spraying application of

toxic pesticides. I question how many municipalities are fully informed of the implication of this new law on their municipality's responsibility and on the members of their community.

Pesticides, and reducing one's exposure to pesticides, are very important issues for our organization. For some of our members, pesticide exposure was a principle contributor to their becoming ill. In the literature pesticides are often cited as one of the major exposures initiating chemical sensitivity illness. Drs. Ashford and Miller noted this point in their Report *Chemical Sensitivity: A Report to the New Jersey State Department of Health* (1989)(1, p.55) and in their book *Chemical Exposures Low Levels and High Stakes* (2. Chapter 1 "Chemical Exposures and Sensitive Populations", p. 5). For an even greater number of chemically sensitive individuals, pesticide exposures are associated with recurrence of symptoms (act as a trigger of symptoms). For some, pesticide exposure has, and can, worsen their level of sensitivity/intolerance. In Chapter 3, "Origins of Multiple Chemical Sensitivity and Effects on Health", Ashford and Miller wrote: "Among the most hazardous exposures for patients seem to be pesticides sprayed outdoors or indoors. Alone, pesticides have accounted for some of the most advanced and persistent cases of chemical sensitivity known to clinical ecologists. As early as 1966, occupational health practitioners observed that certain persons who had recovered from acute organophosphate pesticide poisoning experienced protracted symptoms …" and that "Twenty of 114 individuals stated they could no longer tolerate smelling or contact with pesticides." (2, pp. 62-63). Thus, while important consideration for the public at large, for the chemically sensitive person, prior notification requirements, addressing and the honoring of the pre-existing private opt-out exemptions are critical.

The Massachusetts Emergency Operations Response Plan for Mosquito-Borne Illness does provide for a multi-agency lead by public health and was revised in August 2019. The document appears to have a detailed response plan with guidelines for phased responses and risk categories to address and handle mosquito–borne illness for the Commonwealth. The power granted to SRB under M.G.L. c252, Section 2A must ensure the obligation for enhanced planning on the part of the many agencies and entities who need to work together to plan for a sound public health approach and management of the increased threat of mosquito borne illness. Given the many vulnerabilities among the population there is a need to ensure that a public health approach (risk regarding the disease and risk of exposures to the pesticides used) be essential in this planning. I urge that this Task Force and the Report commissioned and generated under this new law incorporate not only the latest in scientific information and but also policy issues necessitated by a truly public health approach to mitigate arbovirus in the Commonwealth.

Our organization has worked tirelessly to both raise awareness of multiple chemical sensitivity and educate our state legislators, state agencies, officials, organizations and the public about the illness and the needs of those who are already chemically sensitive/intolerant and steps that can be taken to help in the prevention of the illness. Ashford and Miller wrote in the *Chemical Sensitivity* Report's Section "The Regulation of Chemical Exposures and other Preventive Measures": "…adherence to and enforcement of existing environmental regulations is necessary to prevent sensitization of more individuals. The existing standards of OSHA, EPA, and state agencies do not, however, protect those individuals already sensitized. New regulations governing inadequately regulated substances or unregulated application of chemicals, such as pesticides applied in office building, schools or apartment complexes, are also needed. More stringent regulations may be needed to protect both sensitized (and hence chemically sensitive) individuals and individuals who may become sensitized." (1, p.128)

While protecting the public from mosquito-borne illness steps need to be taken to curb exposure to toxic pesticides and chemicals that can seriously harm health and are contributing to chronic illness present in

today's society. I urge that the Task Force's Report reflect the public health perspective with regard to the potential risk that pesticides pose to one's health and include policy that is protective of those who are

most vulnerable to the inherent risk that pesticide exposures pose on their individual right to protect themselves from serious harm to their health.

Sincerely,

Jean A. Lemieux (signed)

Jean A. Lemieux
President

References:

1. Ashford, N., and Miller, C., *Chemical Sensitivity: A Report to the New Jersey State Department of Health*, December 1989.

2. Ashford, N. and Miller, C. *Chemical Exposures: Low Levels and High Stakes*, Second Edition (1998), Van Nostrand Reinhold, New York.

State of New Jersey

MAIL CODE 501-03
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

SHAWN LATOURETTE
Commissioner

May 3, 2021

Via Electronic Submission
Mosquito Control Task Force

RE: Professional Mosquito Control Operations

To Whom this may concern,

I am writing this letter in support of government funded, year-round, fulltime science-based efforts managing mosquitoes that can cause severe nuisance impacting the quality of life in addition to transmitting several diseases that cycle within the environment to animals and people. Providing successful environmentally friendly long-term mosquito control services in the public interest is an all-encompassing data driven process that can be complicated and challenging to explain succinctly.

A fully integrated pest management approach is essential to achieving long-term success. The biology of the mosquitoes within any given region must be taken into consideration. The pest mosquitoes in any given area drive the necessary processes. In general, the mosquito problem can be broken down into two major components. A local problem (larval source impacting nearby area), and a larger overreaching state problem (large larval source impacting distant areas). This breakdown is based on the biology and host seeking habits of the various mosquito species contributing to the overall problem. These mosquito species change as one moves around the country. There is no one size fits all needs approach to managing mosquito populations.

All mosquitoes require water to complete their development. The source and quality of the water serving as larval habitat for mosquitoes varies considerably. Mosquitoes do not recognize political boundaries. With respect to the local problem, several species responsible for both nuisance and disease transmission don't stray far from the larval habitat. These mosquitoes can be a severe problem on a residence, within a neighborhood, or town if enough larval habitat is present. Locally funded efforts can be extremely effective in controlling these mosquitoes. On the other hand, even when these efforts are competently applied and comprehensive throughout the town for example, there are other species of mosquitoes that range far from the larval production habitat in their host seeking behaviors. These mosquitoes can completely overshadow local efforts spent to manage mosquito nuisance and associated disease suppression activities. The source (swamp, large river flood plain, salt marsh) of the larval habitat may be several miles away in a different town, county or state that may, or may not, support a mosquito control program. Local mosquito control efforts in an adjacent town are not effective in managing these mosquitoes before the adult stage is reached. Therefore, the management of and funding assistance to address this overreaching problem of mosquitoes that range five, 10 or more miles from their larval production source should be coordinated at the state level.

State laws mandating mosquito control in the interest of public health were necessary to obtain comprehensive coverage of the mosquito problem in New Jersey. In New Jersey, county government addresses the local mosquito problem through consistent annual support of a mosquito control program. Comprehensive coverage of the state is achieved by every county in state supporting a mosquito control program. The focus is on addressing larval production habitats on both public and private lands within the county boundaries. The state has several departments and agencies working collaboratively with local efforts to address the mosquito problem. The Department of Health, Agriculture, Environmental Protection, and the New Jersey Agricultural Experiment Station

all have active roles. The state also maintains a New Jersey State Mosquito Control Commission that provides state aid resources to the counties in an effort assist with these local efforts and in addressing the larger statewide mosquito problems. The foundation upon which mosquito control operates is surveillance of the nuisance and disease carrying mosquito species within any political entity. Knowing the biology of the mosquitoes present, their role in disease transmission or lack thereof guides management decisions. Having access to all the tools available for successful mosquito control is critical. Be this public education, larval source management options or adult mosquito control options. Knowledgeable well-trained professional staff with mosquito control experience who understand the laws, regulations, available tools and how to properly use them, are an essential component of this overall comprehensive science-based effort to deliver timely targeted mosquito suppression efforts. Regular communication across political boundaries is imperative. In New Jersey, all these activities are coordinated through an Office of Mosquito Control Coordination.

Over the past decade, we have responded to outbreaks of Dengue, Chikungunya, Zika, the largest outbreak of West Nile virus (WNV) on record in New Jersey, and the most widespread outbreak of Eastern Equine Encephalitis (EEE) virus since 1959. La Crosse and Jamestown Canyon virus have also recently been detected in mosquitoes known to feed on humans. Concerning WNV and EEE, we have seen significant activity in areas of the state where virus activity had previously been a rare occurrence. With our ever-warming climate and extended mosquito control seasons experienced, this situation will only continue to worsen.

Finally, I would like to address the opt out situation currently being debated in Massachusetts. The mosquitoes are all in. They do what they do on a timescale determined by the environment they find themselves in. Biology waits for no one. Opting out is a bad policy to consider when protecting public health from mosquito-borne disease is a primary concern. There are times when extreme timely wide area control approaches are necessary to manage the potential transmission of life-threatening disease. Comprehensive coverage of the impacted areas is essential during these times. Sound science drives the need for and timing of these operations. With respect to using EPA registered public health pesticides for mosquito suppression during these events, risk to the public, the environment, and wildlife has been addressed through the registration process. Following the label language is the law in this regard. States can further restrict the use of available formulations should they choose to do so. Advance notification, to the extent possible and dictated by the biology of species of concern, is the best approach to informing residents and those who chose to visit the state of the need for these timely operations being conducted in the public health interest. This noted, a fully integrated well-funded year-round pest management program within each county/project providing comprehensive coverage of the region is the best approach to minimizing the need for these areawide emergency adult mosquito spraying operations. The goal is to ever work in a responsible environmentally friendly manner to prevent the need for these events.

Should you have any questions or require additional information with respect to this correspondence, please feel free to contact me directly, Scott C. Crans, at 609 292-3649 or scott.crans@dep.nj.gov.

Sincerely,

Scott C. Crans
Administrator, New Jersey Department of Environmental Protection, Office of Mosquito Control Coordination

The Commonwealth of Massachusetts
State Reclamation Board

CAPE COD MOSQUITO CONTROL PROJECT
259 WILLOW STREET 2ND FLOOR SUITE 3
YARMOUTH PORT
MASSACHUSETTS 02675

Telephone: (508) 775-1510
(508) 362-9757
Fax No. (508)362-7917

Gabrielle Sakolsky-Hoopes
Superintendent

Barton Morris
Assistant Superintendent

April 27, 2021

Mosquito Control for the 21st Century Task Force
251 Causeway Street
Boston, MA 02114

Dear Task Force Members,

On behalf of the Cape Cod Mosquito Control Project Board of Commissioners, we strongly urge Task Force members to reconsider any assertion &/or implication presented at your recent meeting that claimed our member towns were "disconnected" from district Mosquito Control services. We categorically reject this notion as it is wrong for several reasons and urge you to consider the following facts.

- Our enabling legislation requires 2 seats among the 5 of our Board of Commissioners include a member from the Cape Cod & Islands Selectman & Councilors Association & the other required member from the Cape Cod Town Managers Association. Clearly having two fifths of our Board representing 2 critically important Associations devoted to the best interests of our 15 Cape Towns does in fact ensure our towns are integrally connected to local Mosquito Control.

- Currently one additional member of our Board is the Town of Truro Health / Conservation Agent. This Commissioner is regularly in communication with her peer Health & Conservation Agents across Cape Cod including matters pertinent to Mosquito Control.

- Our Superintendent & Assistant Superintendent regularly work with our 15 member town's Health Agents & DPW staff regarding many aspects of our Mosquito Control services.

- For more than a decade we send our annual budget to all of our member Town Managers. Managers typically share our budget information with Select-Board members &/or Town Councilors & some department heads whom collaborate with our staff.

- Our Management Team make presentations to groups such as the Cape Cod & Islands Selectman & Councilors Assoc.

- A retirement ceremony for longtime Supt. John Doane was hosted at a breakfast meeting of the CCAISACA. This presentation & state proclamation was presented by former State Senator, Rob O'Leary and attended by many town leaders.

Thank you for taking the time to acknowledge these facts. The Districts make great efforts to keep in communication with their member towns, and the on-going working relationships with many municipal staff and agents prove that. Feel free to reach out to our Board of Commissioners with any questions.

Respectfully Submitted,

J. Gregory Milne, Chairman
Cape Cod Mosquito Control Project
259 Willow Street, Unit 3
Yarmouthport, MA 02675
508-775-1510

TO: Massachusetts Mosquito Task Force

Bee Kill From Aerial Mosquito Control

The September 2016 bee kill of honey bees in South Carolina due to a mosquito pesticide spray application is cause for concern of every beekeeper. The destruction of forty-three hives is not just a loss of honey bees, but their honey crop, the pollination of fall plants, and forty-three hives that would be available to pollinate crops next spring. The loss of forty-three hives to a beekeeper is a $21,500 cost to just replace the beekeeping equipment (now toxic from the mosquito spray) and to purchase new honey bees. This does not include the financial loss of the honey crop from this beekeeper's livestock.

Mosquito control pesticide labels clearly state their toxicity to honey bees and other beneficial insects. However, the "public health exemption" allows mosquito control districts to apply these bee toxic pesticides against the label directions (spraying it on blooming weeds and crops, water, and during the daytime when bees are foraging). Communities are concerned with the "night-feeding" mosquito that carries West Nile virus, and now the "daytime-feeding" mosquito possibly carrying the Zika virus. However, w*e can protect pollinators and public health. We can reduce the number of mosquitoes, and reduce the use of bee toxic pesticides. Education and awareness is key.* Mosquitoes typically feed within 300 feet to a maximum of one mile of their breeding area. If you are being bitten by mosquitoes, then you and your neighbors are breeding mosquitoes. To protect our bees and our health, we must all work to reduce mosquito habitat!

Individuals should remove trash and standing water on their own property in order to protect themselves and others from mosquitos, and to reduce the use of bee toxic mosquito control products. The biggest battle is with individuals not taking care of their property. They expect a government mosquito abatement program to address nuisance mosquitoes, when it is only meant to protect public health. Mosquito populations would be greatly reduced if humans would eliminate standing water. A six inch puddle of water can produce 1000 mosquitoes a week. As beekeepers we want our honey bees to have access to pesticide-free water, as well as water free of mosquito larvae. But water is where it starts for mosquitoes. We can control for disease carrying mosquitoes, and the public can help to eliminate mosquito breeding areas.

The main aspect of a community Mosquito Control Program is surveillance. Traps placed throughout the community each day capture mosquitoes for testing, and to monitor mosquito population levels in that area. If populations are high and/or if disease carrying mosquitoes are found the local Health District will combat the mosquitoes with a larvicide, barrier treatment, and/or ULV spray applications (ultra-low volume).

Some cities offer beekeepers the opportunity to "opt-out" of mosquito spray applications near their property. Other communities provide a sign to post at each end of your property so county workers will not spray between the signs (your property frontage). However, a pesticide applicator will continue to spray before and after your property signs. Even if a beekeeper opts out of having their property sprayed for mosquitoes, pesticides drift onto water and blooming plants. Not all mosquito control products have a short residual toxicity, and can last more than

eight hours on the blooming plants and in water. The next day when bees drink from a puddle or stream, or collect nectar from a bloom containing a mosquito control pesticide, the honey bee or native pollinator may die.

Many mosquito control products address mosquito larvae in water, and then imply the pesticides in the water will not harm bees. Bees do drink water. If a pesticide lingers in the water, bees will encounter the pesticide there, as well as on blossoms, and guttation droplets on plants. Honey bees, and native pollinators need access to clean water. Far too many mosquito control documents ignore the fact bees drink water, and mislead the pesticide applicator stating bees stay in their hives after 3 p.m. Many university extension documents and state guidelines claim bees are not active after 3 p.m. which is just blatantly false. Honey bees and native pollinators will forage blooming plants until the sun sets. To fully protect honey bees and native pollinators from mosquito control pesticides, the pesticide should only be applied when it is dark: not twilight, not sunset- dark.

Every living creature needs clean, pesticide free water to drink; and "busy as a bee" means on warm, hot days honey bees work from sunrise to sunset, and they need water to cool the hive, and themselves. Changing water daily in bird baths provides clean water for bees and reduces mosquito breeding grounds. For water features like fountains and small ponds make sure that water is moving or contains aquatic life that will eat mosquito larvae, again reducing mosquito breeding areas.

A public health emergency allows for the exceptions to the pesticide label directions to occur and application of the product made against the label protections for pollinators. Communities must ensure they are truly protecting human health. Ask your local Health Board if they are trapping and testing mosquitoes for disease. If diseases are not found in mosquitoes, then tax dollars should not be wasted applying a pesticide when it is not needed. Prophylactic use of pesticides is as problematic as prophylactic use of pharmaceutical drugs. Regular use depletes their ability to work.

Beekeepers should be able to protect their honey bees from mosquito control products. As a community we should protect our native pollinators as well. As individuals we can be proactive to protect our property from mosquitoes, and protect our honey bees and pollinators from the adverse impact of mosquito abatements. If a health risk is found in trapped mosquitos, a short residual toxicity mosquito control product should only be applied after the sun has set, when it is dark. With the removal of mosquito breeding habitat and disease prevention applications of short residual toxicity pesticides only then will honey bees and native pollinators have a chance to survive mosquito abatements.

As beekeepers become involved with their State Pollinator Protection Plans, we must make mosquito control programs part of Pollinator Protection Plans. As beekeepers move their bees south for the winter to prepare for the next pollination season, we must protect this vital resource pollinating our food supply from the adverse impact of prophylactic applications of mosquito abatement pesticides. We must all work together to ensure our beneficial insects are available to pollinate our backyard gardens, city parks, and Community Supported Agriculture. We must work together to protect ourselves from mosquitoes, reduce the breeding grounds of mosquitoes, and protect pollinators.

Thank you for the opportunity to submit these comments to the Massachusetts Mosquito Control Task Force.

Formally,

Michele Colopy, Executive Director
LEAD for Pollinators, Inc.
May 3, 2021

TOWN OF TRURO
HEALTH & CONSERVATION DEPARTMENT
24 Town Hall Road, Truro 02666
508-349-7004 x119

<u>To: The Mosquito Control Task Force</u>
Date April 30, 2021
From Emily Beebe, Truro Health and Conservation Agent

Thank you for the opportunity to share our experiences with the Cape Cod Mosquito Control Project (CCMCP). As a small municipal department in a location fortunate enough to have a multitude of both fresh and saltwater resource areas we benefit significantly from the work of the CCMCP.

In 2019 we had issues with both EEE and WNV and were immediately informed and assisted by the CCMCP. They are proactive about working with us to mitigate any developing scenarios with water bodies with culvert issues, or seasonal changes as they are on the lookout for the next issue to head-off before it becomes a problem. Their science-based approach and practical "boots on the ground" maintenance and trouble-shooting make them essential partners for our public health and public safety needs. Our DPW knows different members of the crews and are consulted when there are situations where we need to partner. The director of the program, Gabrielle Sakolsky communicates with the Cape and Islands Health Agent Coalition on a consistent basis, in workshops and updates thereby keeping the channels of communication open and developing relationships with Agents directly.

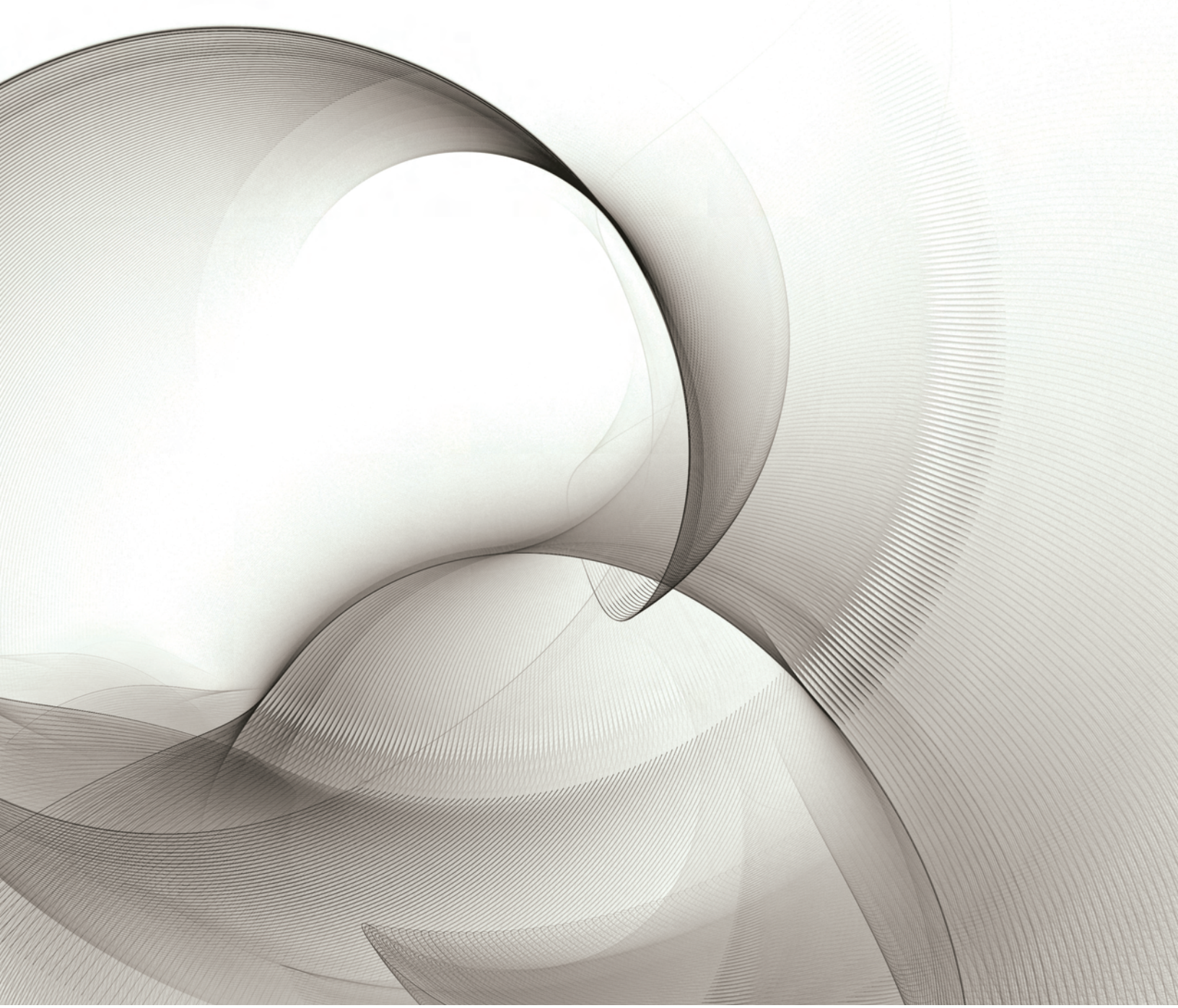
As the Conservation Agent and the Health Agent, I consider them to be exemplary professionals who know the wetland resource areas of my Town just as well as I do.

Comments to State on Opt out application

As a VOLUNTEER local Board of Health member, I am greatly disappointed in how the State has treated us with the opt-out application for the following reasons:

1. Extensive amount of information required. This form appears designed by people who are part of the mosquito control district infrastructure. Local Boards of Health are NOT mosquito control districts, not do we aspire to be such. Our job is education and outreach, not spraying.
2. Timeframe. EEA gave NO advance notice that this application was being released and when it was released, there was very inadequate support to answer questions. We submitted questions to the opt-out email address and 7 days later had to send another email saying we did not receive a response. We got the response 2 days later. It appears EEA was unprepared yet Local Boards of Health, were expected to complete the application on a tight time schedule.
3. Level of effort required. I can't even count the number of volunteer hours spent on the application by myself, my board, and other town officials. For a small town it is totally unacceptable that the State should require this kind of effort.
4. The State is NOT transparent to residents in revealing the cost of mosquito control districts or how they are funded. If a town joins a district, the cost is NOT shown in the town's budget; it is deducted from the town's cherry sheet allotment. It appears the state is giving mosquito control districts an advantage by not disclosing the actual cost of spraying by hiding the actual costs from the residents.
5. The Harvard BOH has conducted numerous forms of outreach on all forms of public health issues for the town. If the DPH is concerned about our education and outreach, they can send a survey and we will tell them. We are NOT under EEA or the State Mosquito Control Board.
6. Mosquito surveillance, of both larvae and adult forms, is important. DPH has a network. The Central Mass Mosquito Control district conducts surveillance, but WILL NOT conduct surveillance in towns who do not want them to spray. Small towns, with limited budgets, cannot afford to conduct such an activity. DPH considers surveillance a priority item; they should be funded to establish a broader sampling network.
7. "To combat mosquito resistance, the dependency on chemical control must be addressed and lead to more sustainable methods, which include habitat modification, improved sanitation, and use of natural controls."[i]. A sustainable form of mosquito control should take precedence, not use of spraying.
8. Aerial spraying is better adapted to some geographic settings than others. The opt-out application did not provide space/ask questions about the geographic setting of the town and the appropriateness of spraying (e.g., heavy forest canopy, presence of endangered animals)
9. The opt-out form should ask one question, "Do you want your community to be sprayed?" If DPH, would like to review local boards of health educational and outreach information, they can ask for it. EEA is not qualified to review and pass judgement on public health education and outreach.

[i] *Pesticides and You,* Volume 36, No.2, Summer 2016



astho™

Before The Swarm:

Guidelines for the Emergency Management of Mosquito-Borne Disease Outbreaks

A Project of the Mosquito Control Collaborative

Before the Swarm:

Guidelines for the Emergency Management of Mosquito-Borne Disease Outbreaks

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A Project of the Mosquito Control Collaborative

Acknowledgements

The Association of State and Territorial Health Offic als (ASTHO) sincerely thanks the members of the Mosquito Control Collaborative (MCC) for their dedication and indispensable contributions to the development of this document. Without their unique perspectives, diversified backgrounds, and incomparable technical expertise, this project would not have been possible.

Chair

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Executive Summary

Mosquito-borne diseases pose a continual threat to the nation's health. Worldwide, mosquito-borne diseases kill over one million people each year[1] and sicken more than 700 million people annually[2], which is almost six times the combined total of people who attended a professional basketball, football or baseball game in the United States in 2007. Many of these same diseases already exist in the United States and other dangerous pathogens could be just a plane ride away from entering the country. In response to this threat, this document provides straightforward and realistic guidance to help state and local agencies, non-governmental organizations, and private industry groups prepare for the emergency management of mosquito-borne disease outbreaks.

This document addresses three trigger events (existing diseases, natural disasters, and exotic diseases) that could necessitate an emergency response. Building on the solid foundation established by the Association of State and Territorial Health Offic als (ASTHO) in the report ***"Public Health Confronts the Mosquito: Developing Sustainable State and Local Mosquito Control Programs"***, this document provides analysis and recommendations for countering the threat of mosquito-borne disease outbreaks in fi e sections:

- **Plan Ahead**
- **Involve Others**
- **Use the Best Science and Data**
- **Inform the Public**
- **Responding to a Mosquito-Borne Epidemic Emergency**

While emergencies can be extremely challenging, careful planning may avert many difficu ties. Mosquito control programs simply cannot respond effectively to exotic diseases, existing pathogens or natural disasters if thorough, deliberate and evidence-based preparation is absent. At the same time, this document provides recommendations for mosquito control in areas with limited resources or a reduced response capacity.

A summary of this document's recommendations is available in a checklist format on the following page. These recommendations are not designed to be all-encompassing, nor will they necessarily apply to every stakeholder involved in the fight aga nst mosquito-borne diseases and nuisance mosquitoes. Rather, this document's analysis and recommendations will assist policymakers to make informed decisions on how best to prepare their respective jurisdictions for the dangerous threat that mosquitoes pose to human and animal health, economic prosperity, and overall quality of life.

Planning and Action Checklist

(These recommendations are included in the beginning of the document for ease of use and are explained in detail later in the document)

Plan Ahead

- Begin now to devise plans for potential emergencies
- Hold on-site training sessions with state epidemiologist and/or entomologist
- Send mosquito control and public health personnel to attend training sessions from specialized providers, if applicable
- Take advantage of online and printed training manuals and pesticide applicator certificat on materials
- Ensure that all persons with a direct role in emergency management activities receive the appropriate training in the National Incident Management System (NIMS) and Incident Command System (ICS)
- Ensure that all persons with a direct role in emergency management activities have a firm grasp of resource typing for the request for assistance agreements between jurisdictions

Involve Others

- Ensure continuity of communication between health agencies, private industry, academic, and other public sector response partners
- Designate one leader who can coordinate emergency mosquito control operations
- Involve entities such as schools, faith-based organizations and churches, community groups, and businesses as distribution pathways for relevant health information
- Coordinate with both elected and non-elected community leaders in the release of important public information
- Maintain a good working relationship with academic partners that permit the sharing of viral surveillance data and technical expertise

Use the Best Science and Data

- Ensure the continuity of surveillance efforts and data collection from a variety of immature mosquito, adult mosquito, equine, human, wild bird, and sentinel vertebrate sources
- Prepare cooperative, resource-sharing agreements with other jurisdictions for use in future emergencies
- Ensure that appropriate emergency management, mosquito control, and public health personnel have a complete understanding of the Emergency Management Assistance Compact (EMAC) protocol
- Access agricultural extension agents and subject matter experts
- Contract private companies to conduct surveillance, if necessary
- Work with state agriculture and public health agencies to facilitate access to important surveillance data from veterinarian associations, zoos, and equine, falconry, and raptor rehabilitation organizations
- Analyze geographic distribution of telephone complaint calls and train volunteers, college interns, and employees to track landing rates as a last resort for a basic source of surveillance data

Inform the Public

- Organize risk communication campaigns that have accurate, clear and timely information to reduce public anxiety and give people practical and concrete steps to protect themselves
- Summarize important messages with phrases that are easy to remember-such as the "Five D's of Prevention"
- Repeat important mosquito control and public health messages on a routine basis even before an emergency starts
- Adapt routine messages with new information that explains any enhanced risk during an emergency
- Translate brochures, public service announcements, and other forms of communication into other languages to reach minority communities
- Visit the CDC's "Fight the Bite" campaign for helpful information on risk communication campaigns (more information available in Appendix A)
- Develop and practice plans to ensure the distribution of important public information
- Route all public messages through the agency Public Information Officer (PIO) for a consistent message
- Maintain regular contact with media outlets by periodically passing along relevant stories through the PIO
- Designate an Incident Command PIO in emergencies where more than one PIO or agency is involved
- Release important public information quickly as time can be of the essence in emergencies
- Work with the PIO to hold a town hall or participatory community meeting about the risks and benefits of using pesticides
- Hold the above public dialogue session(s) even before a disease outbreak occurs

Responding to a Mosquito-Borne Epidemic Emergency

- Collaborate with a variety of organizations that may conduct mosquito control operations, such as community groups, public works departments, and transportation agencies
- Establish shared service agreements, equipment pools, regional districts, and standard contracts for services with other, nearby jurisdictions before an emergency occurs
- Coordinate with public health laboratories for testing and surveillance services during an emergency
- Sign preemptive contingency agreements with private contractors for mosquito control services that stipulate that the businesses will respond within a given time period (i.e. 72 hours)
- Public health and mosquito control agencies should help prepare and regularly update county Pre-Disaster Mitigation Plans together with other emergency management office
- Participate in regional mosquito control teams that could supply technical expertise in the event of an emergency
- Become familiar with federal response partners and their protocols for requesting assistance
- Make informed, evidence-based decisions regarding pesticide applications in the areas where the risk for mosquito-borne disease is highest
- Work with the public to eliminate possible larval habitats, if applicable
- Consider the costs and benefits when implementing 'pay for service' mosquito control initiatives
- Take advantage of GIS tools to track the status of pesticide applications, source reduction efforts and public education message coverage

Monday, August 23, 1999 - New York City

Occasionally, he still became disoriented on his way around town. An observant passerby could easily tell Denis Nash was new to the Big Apple by the way he briefly paused to study the subway map before boarding a train. Indeed, Dr. Nash had just come to New York a few weeks ago.

Dr. Nash was still getting used to the subway and his new job as an Epidemic Intelligence Service (EIS) Office . Dr. Nash, fresh from the Johns Hopkins PhD Epidemiology program and on loan to New York City from the Centers for Disease Control and Prevention (CDC), looked forward to a summer full of learning experiences. He had a million questions for his fellow senior EIS counterpart in New York, but they would have to wait until Dr. Farzad Mostashari got back from vacation.

Dr. Nash was deep in an investigation of a minor salmonella outbreak when, suddenly, the telephone rang. Dr. Nash's boss, Marci Layton, needed his help. An infectious disease physician from Flushing Hospital in Queens had just called with an unusual report. Four elderly patients. Advanced swelling of the brain. Was it an outbreak of Saint Louis encephalitis? Or something else entirely? It had all just begun…

While most areas in the United States do not confront exotic diseases on a frequent basis, the lessons learned from the first West Nile (WN) virus disease outbreak of 1999 in New York City remain important today. Mosquito-borne disease outbreaks can occur suddenly, with little or no warning. It is impossible to predict if such an outbreak will occur after a drought in Texas, in the form of a previously unseen disease agent in California, or as a resurgence of an existing pathogen in Nebraska. The unpredictable nature of these outbreaks demonstrates the urgent need for careful preparation and the incorporation of mosquito control emergency management activities into overall public health preparedness efforts.

The fact that the United States is home to competent hosts and vectors for many of the world's most serious vector-borne diseases underscores the fundamental importance of creating and sustaining mosquito control programs.[3] One key component of these programs is the ability to identify and mitigate mosquito-borne diseases that pose a substantial health threat to the public. This document discusses three trigger events that could necessitate an emergency response and require extraordinary measures and resources to protect the public:

- *Existing Diseases* - For the purpose of this document, existing diseases are defined as mosquito-borne diseases that appear regularly at varying levels of activity within the United States. Examples of existing mosquito-borne diseases in the U.S. include West Nile fever and neuroinvasive disease, St. Louis encephalitis, eastern equine encephalitis, western equine encephalitis, and La Crosse encephalitis. Although these diseases do not routinely appear in every part of the U.S., they often occur in sporadic, focal outbreaks or are consistently present at low to moderate levels in certain geographic areas. While new diseases receive greater media attention, existing diseases have the potential to be just as destructive. While already problematic in many regions, these existing diseases could become more prevalent as human activity continues to expand into previously underdeveloped areas.

- *Natural Disaster* - Natural disasters such as floods, severe storms, or hurricanes often cause great public concern about mosquito-borne disease outbreaks. Members of the public often assume that water-related natural disasters produce more pools of standing water, which lead to

more mosquitoes and more cases of mosquito-borne disease. In reality, mosquito-borne disease outbreaks after natural disasters in the United States are fairly uncommon.[4 5 6]

Despite the overall low risk of immediate disease outbreaks after natural disasters, the case of West Nile virus and Hurricane Katrina in 2005 illustrates the importance of up-to-date surveillance data. Hurricane Katrina apparently did not significant y increase mosquito-related human disease risk, and it is possible that the storm's destruction of mosquito habitat and the dispersal or killing of birds and mosquitoes likely decreased the risk of West Nile virus transmission.[7] However, West Nile virus is still relatively new to many parts of the country, and its full disease profile remains uncertain. Thus, only the sustainable dedication of resources for mosquito control, surveillance, and personnel can help advance both our understanding of West Nile virus, and our capacity to respond in a timely and effective fashion.

- *Exotic Diseases* - As globalization increasingly becomes an aspect of daily life, so too will new, exotic and-re-emerging pathogens from around the world. Exotic mosquito-borne diseases such as Rift Valley fever, dengue, chikungunya fever, Japanese encephalitis, and Venezuelan equine encephalitis could enter the United States through a variety of avenues. Realistically, public health and mosquito control programs cannot expect that the plan for any one exotic disease can provide a reliable one-size-fits all response model. Exotic disease agents could target several different hosts. The dead bird reporting system designed to track West Nile virus cases may work for exotic pathogens like Japanese encephalitis but would not be useful when confronting other diseases such as Rift Valley fever. For example, whereas Rift Valley fever can affect mammals and humans, Japanese encephalitis mostly targets birds, pigs, horses, and humans.[8] The success of a mosquito control program depends on its ability to use multiple surveillance species and methods to provide data on disease threats.

CDC Public Health Image Library

This document discusses the above trigger events and response recommendations for the emergency management of mosquito-borne disease outbreaks. These recommendations are based on the solid foundation established in the initial ASTHO report, **Public Health Confronts the Mosquito: Developing Sustainable State and Local Mosquito Control Programs**, and employ the same easy-to-use format in four sections:

- **Plan Ahead**
- **Involve Others**
- **Use the Best Science and Data**
- **Inform the Public**

An additional segment, **Responding to a Mosquito-borne Epidemic Emergency**, discusses specific emergency mosquito control measures.

Plan Ahead

Emergency response measures alone cannot begin to provide the same level of response as an organized, established mosquito control program. Any emergency can strain an agency's staffing, equipment, and budget resources. State and local mosquito control programs cannot rely on federal agencies to supply timely financ al aid or comprehensive emergency assistance when a disaster strikes. Rather, the ability of state and local actors to provide an effective emergency response depends on independent, well-prepared programs with integrated emergency functions in place. The effic ent emergency management of mosquito-borne disease outbreaks, as is the case with any crisis response, requires thorough planning, practice and implementation.

In addition to improving effic ency, sustainable mosquito control programs can also save valuable local emergency response resources. Sustainable mosquito control programs are relatively inexpensive, costing approximately a national average of about $2.40 in 1999 dollars per person served per year.[9] This small figu e pales in comparison to the costs associated with the emergency use of expensive contractors, equipment, and pesticides. For example, the cost associated with a West Nile virus outbreak in Louisiana during an eight month period from 2002-3 was $20.1 million and included $9.2 million for public health response, $4.4 million for medical and $6.5 million for nonmedical costs.[10] Emergency costs can quickly drain an organization's budget.

Thorough planning also necessitates ongoing professional development for mosquito control staff. Some examples of professional enhancement activities include:

- *Training sessions* - Many local mosquito control staff report that they find on-site training sessions with the state entomologist or epidemiologist to be extremely benefic al experiences. These training sessions can be mutually benefic al. State experts learn what is happening on the ground level, while local mosquito control authorities gain a better understanding about statewide patterns and best practices. Many mosquito control programs have also sent employees to attend training sessions from private firms. Information on training resources is available in Appendix A.

- *Training Manuals and Pesticide Applicator Certificat on* - In addition to these training sessions, several states have produced excellent printed materials and training manuals on safe and effective methods to apply pesticides. Links to specific sites that offer these materials and opportunities is available in Appendix A.

- *National Incident Management System* - All persons with a direct role in emergency response measures must complete the relevant National Incident Management System (NIMS) training courses in order to be eligible to receive federal preparedness funding assistance[11]. This training prepares public health and other response partners for the structured cooperation between public and private sector organizations during any major event. Moreover, a firm grasp of "resource typing" is critical to streamlining the assistance request process. Typing provides a common defin tion of resources that is standardized between jurisdictions and commensurate with the threat level. For example, a Type 1

response team provides a more robust response capability than a Type 4 unit. While not required for most mosquito control offic als, an in-depth knowledge and familiarity with the Incident Command System (ICS) and NIMS will allow state and local programs to integrate themselves into general preparedness efforts. More information regarding NIMS, ICS, and resourcing typing is available in Appendix A.

Involve Others

The emergency management of mosquito-borne disease outbreaks can quickly become an extremely complicated activity. A gap in communication often develops between the people with technical expertise in government/academia and the control agencies with logistical training and experience on the ground. Left unchecked, this gap can extend to responding health agencies as well. Only proactive preparation and continuous interagency communication can ensure that all of these groups benefit from working together. Mosquito control agencies must foster this interagency cooperation well before a mosquito-borne disease occurs. In addition, while interagency cooperation is extremely important, mosquito control programs need a knowledgeable leader who can sit at the top of the chain of command and efficient y direct activities during an emergency. Mosquito control programs that wait until an emergency occurs to start forming cooperative interagency relationships or designating leadership roles will find it difficu t to conduct an effic ent emergency management operation.

Mosquito control programs benefit from taking a broad view of important stakeholders in public education efforts. Organizations such as schools, faith-based organizations and churches, community groups, and businesses can serve as valuable distribution pathways for relevant health information. Mosquito control program staff can work with both elected and non-elected community leaders to coordinate the release of important public information. The maintenance of a good working relationship with academic partners and access to viral surveillance data at these institutions can help guide an appropriate response. The response partners listed in Appendix A are also helpful sources of information and cooperation.

Use the Best Science and Data

Effective surveillance is key to any effective response, as it allows mosquito control programs to rapidly assess the scale of the emergency and determine the type and extent of proper response measures. In addition, the Federal Emergency Management Agency (FEMA) requires surveillance data to approve disaster assistance requests.[12] Comprehensive mosquito control programs have access to surveillance data from a combination of immature mosquito, adult mosquito, equine, human, wild bird, and sentinel vertebrae sources (please see Table 1 for a schematic representation). Conversely, mosquito control programs with limited surveillance capability will be hard-pressed to respond effectively.

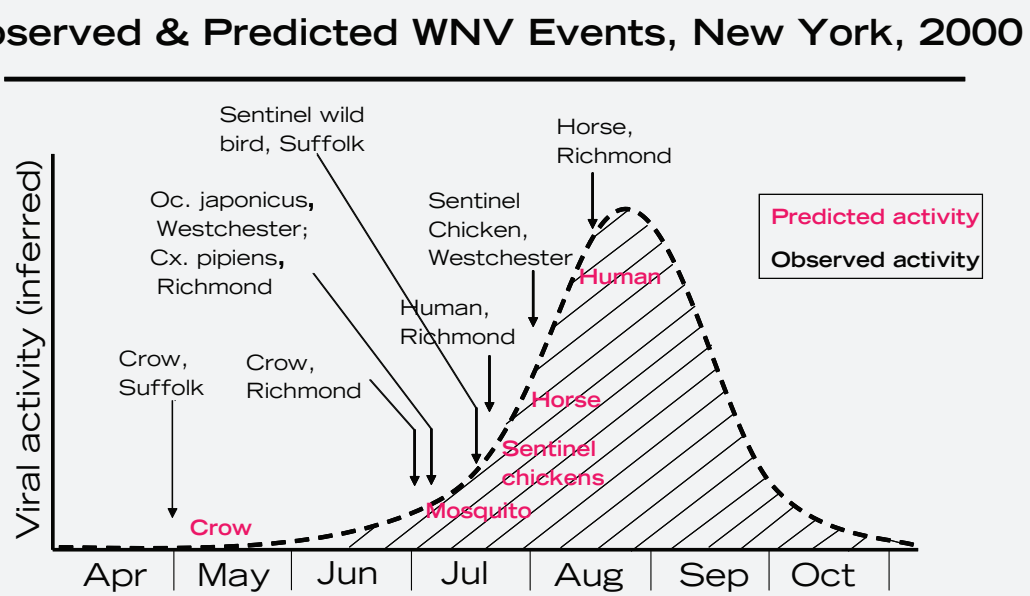


Figure 1 - A good surveillance program can provide early evidence of an impending epidemic, giving agencies a better chance of preventing human cases.[13]

Temporary solutions to the problem of a lack of surveillance resources can never substitute for in-house knowledge and human resources. However, in an emergency situation, mosquito control programs with limited or no funding still have options. In the past, these programs have successfully pursued cooperative relationships and information sharing with neighboring jurisdictions. While the requesting state still must pay for the use of borrowed resources, the Emergency Management Assistance Compact (EMAC) helps facilitate the process by which member states share equipment and human resources during emergencies. Successful examples in New York (West Nile virus, 1999) and Kansas (flood ng, 2007) have helped to establish precedents for the sharing of resources for surveillance and/or mosquito control under EMAC. Such agreements between states are most effective when written before an emergency event occurs. State and local mosquito control programs may sign other agreements with neighboring jurisdictions for the sharing of data and information. While these agreements are valuable tools, however, they will be of limited assistance if neighboring areas are facing the same outbreak as the requesting agency.

Mosquito control programs with limited or no funding can work with universities or colleges to access experts and agricultural extension services provided through such institutions. Additionally, mosquito control programs may contract private companies to conduct surveillance (see Appendix A). State agriculture and public health departments can facilitate access to surveillance data from veterinarian associations, zoos, and equine, falconry, and raptor rehabilitation organizations. As a last resort, areas with very limited or no funding have analyzed geographic distributions of telephone complaint calls and trained volunteers, college interns, and employees to track landing rates as basic forms of surveillance data. Table 2 showcases the importance of having at least some sort of surveillance data in a mosquito-borne disease outbreak.

Figure 2[14]

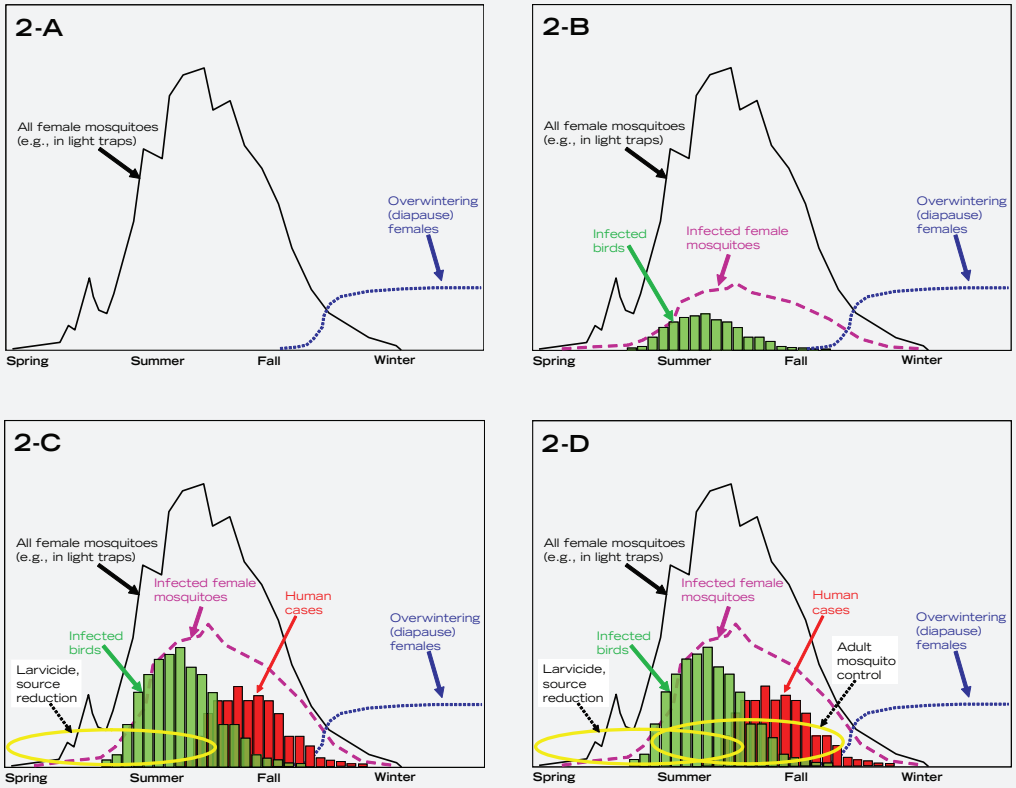


Figure 2 shows the sequence of events in the annual transmission cycle of an arbovirus such as West Nile virus.

Figure 2-A shows the annual abundance pattern of mosquitoes in most of the U.S. Female mosquitoes start to appear in early to mid-spring (black line), the population peaks in mid-summer for most species, then drops off in the fall. At some point in late summer or early fall, newly-emerged female mosquitoes no longer seek a blood meal, but instead feed on plant nectars in preparation for winter survival (called diapause).

Figure 2-B shows what happens in a year with minimal virus activity. Transmission between mosquitoes and wild bird hosts occurs, but virus activity does not "spill over" into urban or suburban settings, and there are few or no human cases. Female mosquitoes start to appear in early to mid-spring (black line) as before. Small numbers of infected mosquitoes (purple dashed line) and infected birds (green bars) start to show up at different points in time over the summer, depending largely on ambient temperature and other environmental factors. The risk of virus transmission to humans is fairly low.

Figure 2-C shows what happens in a year when virus activity is more intense and human cases begin to appear. Virus activity "spills over" into urban or suburban settings, and there are cases in humans (red bars) and domestic animals. Infections in mosquitoes (purple line) and wild birds (green bars) normally appear before cases in humans (red bars). By monitoring activity in mosquitoes and birds, vector control programs can anticipate increased virus activity and take appropriate action. Early-season (time period marked by the yellow ellipse) source reduction (that is, larval habitat elimination) and the application of larvicides, if properly carried out, can greatly reduce the likelihood of an epidemic.

Unfortunately, once emergence of new adult mosquitoes has peaked and large numbers of infected mosquitoes are on the wing (**Figure 2-D**), larviciding and source reduction are much more limited in their impact on virus transmission. At this point, adult mosquito control (period marked by the second yellow ellipse) becomes the primary resource for interrupting virus transmission.

Inform the Public

Informing the public is a key state and local public health agency function during an emergency response situation. Effective risk communication campaigns are successful because they provide accurate, clear, and timely information, which can reduce public anxiety and give people concrete steps to protect themselves.

- *Repetition* - An emergency risk communication program should complement concepts that are already familiar to the population from previous, routine messaging campaigns For example, many mosquito programs summarize mosquito avoidance efforts by educating the public about the "5 D's of Prevention" (Dress, Drain, DEET**, Dusk, Dawn) in response to endemic disease prevention efforts. Repetition of core messages during an emergency can reduce anxiety, although the risk communication program should explain any enhanced risk during an emergency response to help people make informed risk calculations. Brochures, public service announcements, and other forms of communication in several languages can assist in efforts to reach minority communities. The CDC's recent "Fight the Bite" campaign offers simple, effective materials for use during both emergency and non-emergency public education programs (More information available in Appendix A).

- *Regularity* - As natural disasters may interfere with normal media operations, mosquito control programs should develop and practice a plan to ensure the distribution of important public information. Where applicable, agencies should also routinely discuss important matters with the Public Information Officer (PIO) to ensure a consistent message. For the sake of consistency, all public messages should go through the PIO to prevent the mixing of messages and a decline in public confidence. Through the PIO, mosquito control programs should maintain regular contact with media outlets by periodically passing along relevant stories. When more than one responding agency is involved, the PIOs at the different institutions should communicate with one another and designate an Incident Command PIO to ensure a cohesive message. This continued contact will be of great value during emergencies when important public information requires timely distribution.

- *Rapidity* - Water-related disasters underscore the importance of enacting a rapid risk communication strategy. Effective risk communication can decrease the danger of a potential mosquito-borne disease outbreak. Depending on the species, new mosquitoes may appear 5-10 days after a water-related natural disaster and increased mosquito activity may continue for several weeks thereafter[15]. Even without the presence of disease-carrying mosquitoes, large numbers of biting nuisance mosquitoes can seriously hamper power restoration activities, impede recovery efforts, and pose significant public health hazards. For example, after Hurricane Katrina in 2005, researchers recorded landing rates (defined as "a count of the number of mosquitoes that land on a person in a given amount of time"[16]) of up to 200 per minute or more[17], which made life unbearable for recovery workers and regular citizens alike. Damage and destruction of homes, power outages, hot temperatures, and recovery work increase the amount of time people spend

* *Note: DEET is currently one of several repellent products recommended by CDC.*

outdoors. Even mild damage to doors, windows, and screens can allow mosquitoes to enter homes. This increased exposure to mosquitoes emphasizes the importance of disseminating protection messages and providing appropriate materials. Quick and effective risk communication regarding risk and advised courses of action can protect these vulnerable populations.

The mere implementation of risk communication messages does not mean that the public will immediately accept the program's advice. The target audience must also see the recommended actions as practical and feasible. The public must also believe that the risk is substantial enough to take action. Several West Nile virus studies suggest that many people who ignore advice to wear repellent or adopt other preventive measures do so because they do not perceive the risk of contracting mosquito-borne disease to be high enough to warrant such actions. People most often report they believe their time of exposure is too short for them to be bitten or that repellents are inconvenient as reasons for non-use of repellent.

Some people have negative attitudes regarding mosquito repellent. These surveys indicate that some people do not like the way traditional mosquito repellents smell or feel on the skin. Other respondents have questions about safety. Recent public information campaigns have sought to address safety concerns and highlighted the newest generation of mosquito repellents, which may counter some of these concerns.

Effective risk communication is also crucial in engaging groups opposed to pesticide application. Wide-area pesticide use is controversial in some communities. As the Environmental Protection Agency indicates, "no pesticide is 100% safe and care must be exercised in the use of any pesticide."[18] Opponents of pesticides have used legal suits and other mechanisms to limit or even prevent mosquito control spraying efforts from taking place. This opposition can seriously affect an unprepared program's ability to respond quickly to mosquito-borne disease during emergencies.

Studies by the EPA, Karpati, et al.; Currier, M, et al.; and Peterson, et al. support the idea that the benefits of controlling the spread of vectors with pesticides, when conducted according to the directions on the label, outweigh the risks of potential harmful health effects from pesticide spraying.[19 20 21] To ensure that the public fully understands and embraces this risk/benefit consensus, mosquito control programs and PIOs are most successful when they initiate an ongoing dialogue with community members before a disease or a natural disaster occurs. Town hall and participatory community meetings have allowed members of the public and mosquito control programs to openly discuss the most current understanding of the health risks of pesticides. Mosquito control programs can use these meetings to discuss how the relative health risk of pesticide spraying is considerably lower than the risks posed by many mosquito-borne diseases such as West Nile virus. An guide to holding productive dialogue sessions with communities is available in Appendix A.

Responding to a Mosquito-borne Epidemic Emergency

Emergencies affect multiple agencies within the community and demand timely, effective, and well-coordinated response measures. A detailed response matrix published by CDC is found in Appendix B. Many organizations, from community groups to public works departments to transportation agencies, conduct mosquito control operations and all are valuable partners during emergencies. Mosquito control programs should use this matrix to help coordinate response measures. Several other key components are listed below:

- *Resource Sharing and Ability to Acquire Resources Quickly* - Rapid procurement of mosquito control resources can make a great difference in emergencies. During the 1999 experience with West Nile virus, New York City quickly purchased or borrowed (from Suffolk County) the necessary equipment, human resources, or pesticides. The establishment of shared services agreements, equipment pools, regional districts, and standard contracts for services can be extremely helpful to mosquito control programs with limited or no funding. Public health laboratories in other areas may assist with testing and surveillance during an emergency.

  Contractors can provide immediate help, but may be already committed elsewhere or prohibitively expensive for many communities. To ensure a timely response, mosquito control programs can preemptively sign contingency agreements that stipulate that contractors will respond in a given period (e.g. 48-72 hours). For an innovative and successful example of resource sharing and cooperation between the public and private sectors, please see the case study on the following page.

- *County Pre-Disaster Mitigation Plan* – Each county in every state should prepare and regularly update their county Pre-disaster Mitigation Plan. Public health and mosquito control offic als should contact their county Emergency Management or Disaster and Emergency Services office and collaborate in the development of this important planning document. This accomplishes three things:

  1) begins a communication relationship with the local emergency planner
  2) helps gain visibility for the issue so it is remembered during general county emergency planning
  3) qualifies your department for future pre-disaster mitigation funding from federal agencies.

- *Regional and Federal Response Partners* - Interested mosquito control programs can take the idea of cooperation one step further. Regional mosquito control teams of veteran experts could make themselves available for technical assistance in the event of a disease outbreak. Such teams would be able to complement the outbreak investigation work often conducted by CDC, but would be able to remain available on a long-term basis.

  For presidentially declared emergencies, the Federal Emergency Management Agency may be able to provide reimbursement for mosquito control costs. However, this process can be time-consuming and FEMA will only reimburse mosquito control programs for

eligible costs. More information about FEMA's reimbursement policy for mosquito control costs is available in Appendix A.

US Air Force Reserve

The military may provide aerial applications of insecticides for approved, presidentially-declared emergencies. The US Air Force Spray Flight has historically participated as part of FEMA-funded emergency response initiatives. Several aircraft are available for large area rapid mosquito control where such measures are warranted.

- *Rapid Informed Deployment of Chemical Measures* - While biological controls, sanitation programs, and wetlands management are critical components of sustainable mosquito control programs, they are slow to take effect. Chemical measures have become a cornerstone of many mosquito control programs, but they also have some significant drawbacks in emergencies. If a natural disaster has created many potential habitats for mosquitoes, it will be difficu t (both economically and logistically) to apply larvicide to huge areas of land. Larviciding after a natural disaster may also prove unnecessary if dry conditions prevent larvae from developing.

  Adulticides also have significant drawbacks. Adulticiding is expensive and its efficacy is dependent on a large variety of factors, such as temperature, rainfall, humidity, wind patterns, geographic distribution of the application, altitude above the ground (in aerial applications), and expertise of the applicators. Since adulticides only kill those mosquitoes that are exposed to pesticide droplets, spraying is not a "one-and-done" solution. Instead, adulticiding requires multiple applications separated by anywhere from 2-4 days. Finally, if mosquito control activities begin too late, then no amount of larviciding, adulticiding or source reduction can prevent an outbreak or significant y reduce large numbers of nuisance mosquitoes.

  Still, given these considerations, the use of larvicides and the targeted application of adulticides are important aspects of emergency management operations. Larvicides will help lessen the threat of a future outbreak. The use of adulticides can protect recovery workers, large public gatherings, and other exposed groups. As each species of mosquito has different activity patterns, control programs are most successful when they use surveillance data to determine the correct time, place, and frequency of pesticide application. In order to be most effective, mosquito control programs should prioritize pesticide application according to risk. Locations with high population densities, mosquito-borne disease activity, popular outdoor events (sports events, fairs, concerts, etc.), large numbers of recovery workers, homes without power, the elderly, and displaced individuals living in temporary housing or compromised shelters should receive priority attention. Control programs must also consider the geographic area of the outbreak and its corresponding weather and climate conditions.

Case Study - Georgia's Emergency Mosquito Surveillance Trailer[22 23 24 25 26]

From April to June 2007, wildfi es blazed through Ware County, Georgia. The fi es eventually burned close to 600,000 acres in south Georgia and north Florida. After weeks of intense fight ng, the massive fi es were fina ly extinguished. Just when the community thought it could fina ly catch its breath, an unforeseen problem surfaced. Mosquitoes breeding in the equipment tracks and water left behind after the fi e fight ng efforts created the increased potential for mosquito-borne diseases. Adding to the problem were the facts that the fi es burned much of the vegetation that would normally soak up water.

Although the fi es had been declared an emergency and their response was funded through the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA), no one had thought to include fight ng the outbreak of mosquitoes into the request for assistance. Luckily, Ware County was able to request the assistance of the Georgia Emergency Mosquito Surveillance Trailer.

Georgia Division of Public Health

The Georgia Emergency Mosquito Surveillance Trailer is a 16-foot trailer with equipment to support surveillance of vector and nuisance mosquito species. This trailer is designed for use during any emergency or disaster where mosquitoes constitute a public health problem either by virtue of disease transmission or by nuisance factor. The trailer has desk space for fi e people, storage, an air conditioner and a generator. Equipment in the trailer includes microscopes, mosquito traps, cryolizers, larvae collection kits, a backpack aspirator and a backpack sprayer. Any geo-politically recognized level of government within Georgia or in a neighboring state with a mutual aid agreement can request to use the trailer and equipment, along with the assistance of the state medical entomologist from the Georgia Department of Human Resources' Division of Public Health (DPH).

Since Ware County, like many Georgia counties, had limited resources for mosquito surveillance they contacted Trey English who is a mosquito control specialist for ADAPCO, a provider of products, technology and services to the mosquito control industry. English used the trailer and equipment to collect mosquitoes in the area and documented copious numbers of Ps. columbiae, Ps. ciliata and Ae. vexans. With this surveillance data in hand, the county was able to justify the need for emergency mosquito control and the Governor was able to commit discretionary funds to assist with this effort.

English worked with the Georgia DPH, using the data collected, to develop a plan to deal with the mosquito problem. Soon spray block maps were created and, just as an additional wave of mosquitoes was hatching, airplanes were treating the area. Further surveillance showed the efforts were successful, leading to a major reduction in mosquito populations.

With the availability of the Georgia Emergency Mosquito Surveillance Trailer, Ware County was able to acquire data, to document the need for emergency mosquito response, to obtain financ al support and to use the data to make good mosquito control decisions in a timely manner.

- *Timely Source Reduction* - The effective emergency management of mosquito-borne disease outbreaks and nuisance mosquitoes often requires that response partners enlist the public in source reduction efforts. For areas with limited or no funding, public service announcements and educational campaigns can be an inexpensive and effective way to get people to eliminate standing water.

  At the same time, large-scale elimination of standing water may not be feasible, especially in the wake of natural disasters. While members of the public can turn over empty pots or clean birdbaths, they cannot drain primary sources of mosquitoes such as rice fie ds, drainage areas, or ponds. In addition, only timely, informed surveillance data can spur effective source reduction efforts, as these activities depend greatly on the type of mosquito species present in the affected area(s).

- *Pay for Service* - Several counties and communities have used "pay for service" models with some success in the past. Such systems charge communities for pesticide applications to control adult mosquitoes. While such initiatives may provide service for those areas willing to pay the fees, the environmental justice implications of such

a model raise concerns that low-income areas would not receive the same treatment as wealthier communities. Furthermore, "pay for service" models do not take into account the short-lived nature of pesticide application or the fact that mosquitoes may migrate from non-paying areas.

- *Real Time Use of GIS Tools* - Computer-based Geographic Information Systems (GIS) can provide mosquito-control programs with instantaneous mapping of target areas. Whenever possible, spray maps are most useful when prepared and updated regularly in advance of the trigger event. GIS can greatly increase the effic ency of control measures, as it can supply a real-time map of the status of pesticide application, source reduction efforts, and public education messaging coverage. While some advanced GIS programs may be too expensive for many mosquito control programs, free Web-based services such as Google Earth can still be helpful.[27]

Conclusion

Mosquito control, public health, and emergency response programs face constant challenges. Increased global travel, natural disasters, changing climates, and the movement of vectors and pathogens are just a few of the issues that contribute to the complicated threat of mosquito-borne disease outbreaks.

While the exact location, scope, and severity of the next mosquito-borne disease outbreak remains unclear, one thing is certain. Jurisdictions that begin to prepare and practice now for future mosquito-borne disease threats will find themselves in the best position to protect public health when an outbreak occurs.

Appendix A

Annotated Mosquito Control Resources Alphabetically by Topic

Associations

Please note that a comprehensive list of state mosquito control associations is available at http://www.mosquito.org/resources/links.aspx.

American Mosquito Control Association (AMCA) (http://www.mosquito.org/)
A national organization that combines work on mosquito control issues and related health policy with excellent general information and further resources. AMCA also publishes the quarterly Journal of the American Mosquito Control Association.

American Public Works Association (APWA) (http://www.apwa.net/)
The national and international professional and educational association of public works agencies. While mosquito control resources on this website are limited, APWA does have many active members who work on relevant mosquito control issues.

Association of Public Health Laboratories (APHL) (http://www.aphl.org/Pages/default.aspx)
A national organization that provides support to the nation's public health laboratories through the promotion of effective programs and public policy.

Association of State and Territorial Health Offic als (ASTHO) (http://www.astho.org/)
The national nonprofit o ganization representing the state and territorial public health agencies of the United States, the U.S. Territories, and the District of Columbia. The ASTHO vector control page is available at http://www.astho.org/index.php?template=mosquito_control.html.

Mid-Atlantic Mosquito Control Association (http://www.mamca.org/)
A regional network of mosquito control actors from eight Mid-Atlantic states.

National Association of County and City Health Offic als (NACCHO) (http://naccho.org/)
The national nonprofit o ganization representing the local health departments of the United States. The NACCHO mosquito control page is available at http://www.naccho.org/topics/environmental/mosquitocontrol.cfm.

National Emergency Management Association (http://www.nemaweb.org/)
The professional association of state emergency management directors.

Northeastern Mosquito Control Association (http://www.nmca.org/)
A regional association of several Northeastern states.

Northwest Mosquito and Vector Control Association (http://www.nwmvca.org/)
A regional organization of five Northwestern states and th ee Canadian provinces.

Society for Vector Ecology (SOVE) (http://www.sove.org/Home.html)
The professional organization of vector biology and control experts. SOVE also publishes the Journal of Vector Ecology.

West Central Mosquito and Vector Control Association
(http://www.westcentralmosquitoandvector.org/)
A regional network of eight Great Plains and Rocky Mountain states.

Federal Agencies

Centers for Disease Control and Prevention (CDC) Division of Vector Borne Infectious Diseases (DVBID) (http://www.cdc.gov/ncidod/dvbid/index.htm)
A federal and international reference center for mosquito-borne and vector-borne diseases.

Federal Emergency Management Agency (FEMA) (www.fema.gov)
A federal agency which has the ability to reimburse jurisdictions for mosquito control costs during a presidentially-mandated emergency. FEMA's guidelines for the funds disbursement is available at http://www.fema.gov/government/grant/pa/9523_10.shtm.

U.S. Air Force Medical Entomology
(http://www.afpmb.org/military_entomology/usafento/af.htm)
The network of medical entomologists responsible for the protection of Air Force personnel from vector-borne and other disease threats.

U.S. Air Force Reserve Aerial Spray Flight
(http://www.youngstown.afrc.af.mil/units/aerialspraysquadron/index.asp)
A wing of the Air Force Reserve which has limited capacity to conduct pesticide application during emergencies.

U.S. Army Medical Entomology
(http://www.afpmb.org/military_entomology/usarmyento/army.htm)
The network of medical entomologists responsible for the protection of Army personnel from vector-borne and other disease threats.

U.S. Army Medical Zoology Branch (http://139.161.100.20/dphs/MedZoo/mission.htm)
Provides training on vector-borne disease control to Army personnel.

U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS)
(http://www.aphis.usda.gov/)
A branch of the U.S. Department of Agriculture which specializes in the protection of agricultural resources, plants, and animals (including vector-borne diseases).

U.S. Environmental Protection Agency (EPA) Mosquito Control
(http://www.epa.gov/pesticides/health/mosquitoes/index.htm)
Provides information on mosquito control strategies and pesticides.

Grants

Epi and Lab Capacity Program Grant Information
(http://www.cdc.gov/ncidod/osr/site/epi_lab/)
Offers a primer on the CDC's ELC grant program.

Risk Communication

Agency for Toxic Substances and Disease Registry (ATSDR) (http://www.atsdr.cdc.gov/)

A guide to holding productive dialogue sessions with the community is available at http://www.atsdr.cdc.gov/risk/riskprimer/index.html.

Centers for Disease Control and Prevention (CDC) (www.cdc.gov)

Information on the "Fight the Bite" risk communication campaign is available at http://www.cdc.gov/ncidod/dvbid/westnile/prevention_info.htm.

Training Materials

American Association of Pesticide Safety Educators (AAPSE) (http://www.aapse.org/)

A national organization providing pesticide education and applicator certification inform tion for each state. Specific information for each state is available under the 'Pes icide Safety Programs' link at http://pep.wsu.edu/psp/.

Association of American Pesticide Control Offic als (AAPCO) (www.aapco.org)

A national organization which offers pesticide regulation information.

American Mosquito Control Association (AMCA) (http://www.mosquito.org/resources/links.aspx)

Provides links to training websites and information.

Centers for Disease Control and Prevention (CDC) (http://www.cdc.gov/ncidod/dvbid/westnile/education.htm#training).

Provides taxonomic guides for mosquito identification and trainin materials.

Federal Emergency Management Agency (FEMA) (www.fema.gov)

Information on the National Incident Management System (NIMS) and the Incident Command System (ICS) is available at http://www.fema.gov/emergency/nims/nims_training.shtm. More information on resource typing is available at http://www.fema.gov/pdf/emergency/nims/resource_typing_qadoc.pdf.

Appendix B

Arboviral Disease Outbreak Risk Categories[28]

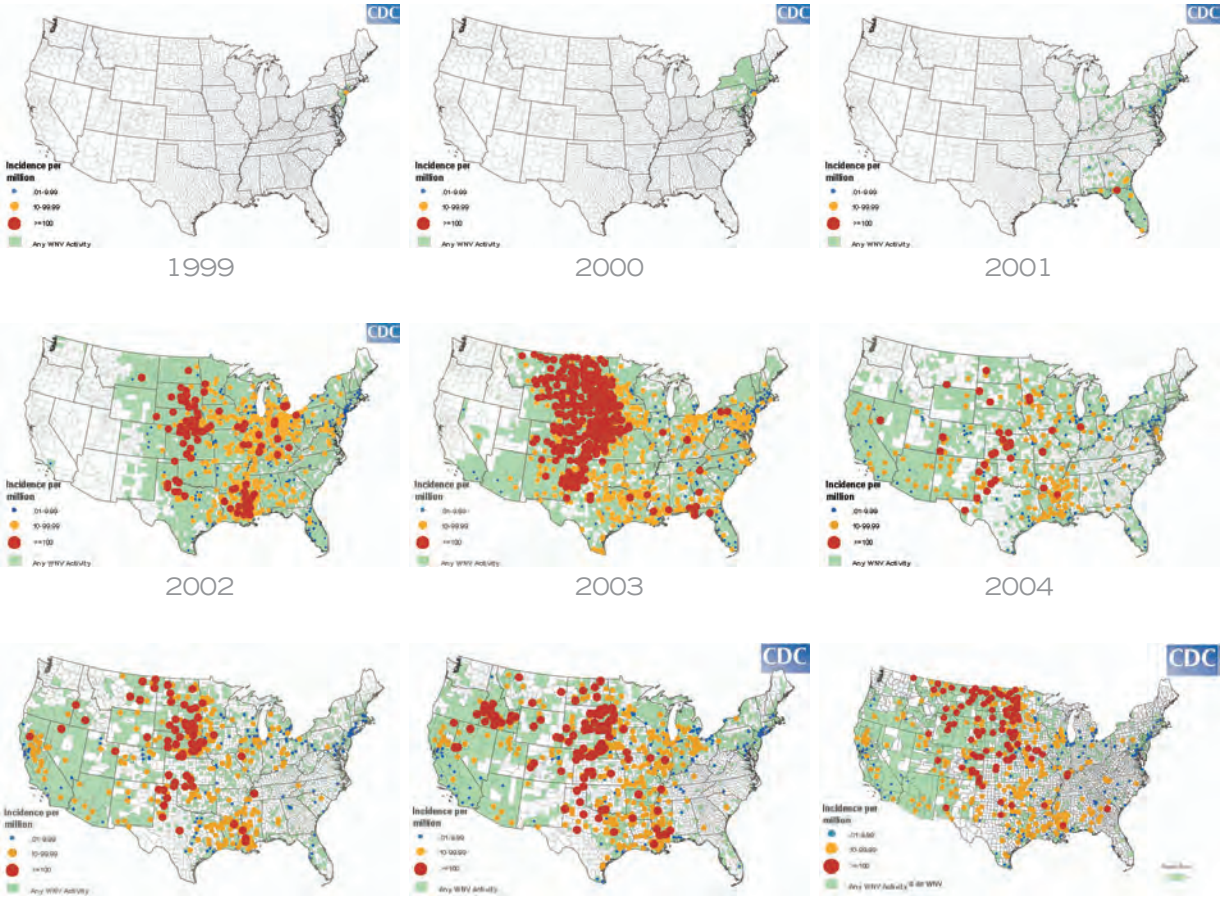
Defin tions and stepwise response for risk categories for mosquito-borne arboviral disease outbreaks in the United States. Risk categories are tentative and approximate. Local and regional characteristics may alter the risk level at which specific actions must be taken.

Category	Probability of outbreak	Definition	Recommended response
0	Negligible or none	Off-season; adult vectors inactive; climate unsuitable	None required; may pursue source reduction and public education activities
1	Remote	Spring, summer, or fall; adult vectors active but not abundant; ambient temperature not satisfactory for viral development in vectors	Source reduction; use larvicides at specific sources identified by entomologic survey; maintain vector and virus surveillance
2	Possible	Focal abundance of adult vectors; temperature adequate for extrinsic incubation; seroconversion in sentinel hosts	Response from category 1 plus: Increase larvicide use in/near urban areas; initiate selective adulticide use; increase vector and virus surveillance
3	Probable	Abundant adult vectors in most areas; multiple virus isolations from enzootic hosts or a confirmed human or equine case; optimal conditions for extrinsic incubation and vector survival; these phenomena occur early in the 'normal' season for viral activity	Implement emergency control contingency plan: Response in category 2 plus: Adulticiding in high risk areas; expand public information programs (use of repellents, personal protection, avoidance of high vector contact areas); initiate hospital surveillance for human cases
4	Outbreak in progress	Multiple confirmed cases in humans	Continue with emergency control contingency plan: Concentrate available resources on strong adulticiding efforts over areas at risk; hold daily public information briefings on status of epidemic; continue emphasis on personal protection measures; maintain surveillance of vector/virus activity, human cases

Appendix C

West Nile Virus Human Neuroinvasive Disease Incidence in the U.S., 1999-2007[29]

The following disease maps show how the initial outbreak of West Nile virus in New York City in 1999 spreads to every state in the continental United States by 2006. This rapid spread foreshadows the ease by which an even more destructive virus could spread throughout the United States.



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(202) 371-9090 tel
(202) 371-9797 fax
2231 Crystal Drive, Suite 450
Arlington, VA 22202
www.astho.org

Before The Swarm:
Guidelines for the Emergency Management
of Mosquito-Borne Disease Outbreaks
A Project of the Mosquito Control Collaborative
July 2008
PUB-0807001

CAPE COD COOPERATIVE EXTENSION

3195 Main Street - PO Box 367
Barnstable, MA 02630-0367 (508)
375-6690
www.capecodextension.org

May 4, 2021

To Whom it May Concern:

We are very familiar with the work of the Cape Cod Mosquito Control Project and commend their efforts to minimize the exposure risk to vector-borne diseases such as West Nile and EEE, a highly successful prevention program. Cape Cod Cooperative Extension manages a very successful prevention program for tick-borne diseases like Lyme. This program is managed by our entomologist Larry Dapsis.

Larry is in constant contact with superintendent Gabrielle Sakolsky. There is free exchange of information about the changing field situations. This greatly enhances the strength of our outreach programs with the general public. People appreciate the fact that we have outstanding professionals that can paint an evidence-science based picture of the domain of vector-borne diseases.

We look forward to a continuing productive collaboration.

Sincerely,

Michael S. Maguire
Director, Cape Cod Cooperative Extension
mmaguire@barnstablecounty.org
508-375-6701

United States Department of Agriculture

Natural Resources Conservation Service
West Yarmouth Field Office, 303 Main St., Rte. 28, West Yarmouth, MA 02673-4661
508-771-6476 | fax 855-596-7671 | www.ma.nrcs.usda.gov

TO: Mosquito Control for the Twenty-First Century Task Force 04/30/21

Hello Members of the Task Force:

The Natural Resources Conservation Service (NRCS) is currently implementing the Cape Cod Water Resources Restoration Project in Barnstable County focusing on salt marsh restoration, improving diadromous fish passage, and treating stormwater runoff where there is an impact to wild harvest and aquacultural shell fishing areas. The first two especially involve work directly in wetlands where water flow and depth are critical factors to the success of the project. Mosquito Projects work in theses same areas and their goals and actions overlap to a significant degree with ours and in some cases with town officials who have responsibilities to manage these areas in general.

We have found that great benefit by consulting with the Cape Cod Mosquito Control Project for information about water flow under existing conditions, what they plan to be under restored conditions, and how that impacts design and future management. Here are two examples of the dozen or so that are under consideration:

We have a fish passage project that runs through an old cranberry bog. The channel needs clearing and possibly some dredging. CCMCP works in the area. Once completed there will be a different water management regime to facilitate fish migration. It will need to be good for the fish and not create mosquito management problems as the flows and water depths change. We are getting input from CCMCP to make sure that their job is not made harder and quite possibly will be made easier.

The second restoration is for a salt marsh. These tidally restricted areas contain a number of spots that have subsided over the years and possibly will not drain very well when the tidal flow is restored. These ponded areas could be new significant breading areas. We are working with CCMCP to monitor these areas and may engage them to assist with some new channel work to improve drainage from them and allow predatory fish access to feed on the larvae.

I hope this illustrates how a mosquito control project is a valuable partner in restoration projects all over the state.

Thank you for your consideration,

Stephen Spear

Conservation Planner – Cape Cod Water Resources Restoration Project

Stephen.spear@usda.gov

774-212-0572 (cell)

Jones River Watershed Association

781-585-2322 • 55 LANDING ROAD, KINGSTON, MASSACHUSETTS 02364 • WWW.JONESRIVER.ORG

May 3, 2021

Comment to the Mosquito Control Task Force for the 21st Century

1) Assessments for efficacy MUST include impacts on the environment including: impacts on predators of mosquitoes including: Bats, Dragonflies, frogs and tadpoles, fish and eels, lobster, crabs, clams.

2) Impacts on those native species should also include the impact of losing them on the particular environment, such as pollination; species balance: ecosystem integrity.

3) Financial efficacy should be included. Given the financial and climate burden of constant truck spraying, and aerial spraying annually, this expense should be compared with ecological restoration activities that are more enduring and encourage an ecological balance.

4) The information from the Districts is not helpful for those trying to do ecological restoration. To say we have sites, but not disclose where those sites are, is very unhelpful. To have a couple of larvae trigger an aerial spray seems to be a panic driven reaction rather than a program that will bring us back to balance.

5) With climate change we have to work harder and faster to restore the environmental resources, not waste money and damage the environment further with ill-advised poison applications.

6) The revelation that PFAS is in the products and containers is an indication that we do NOT know all we need to know when imposing such wide-ranging impacts on Commonwealth Nature.

7) The Districts claim that they do Education. We never see education from them. Covid education is a model. If education is to be effective it has to be relentless and widespread. People are the cause for most spray events, and is not just for EEE and WNV--it is for outdoor parties and recreation. People can spray themselves and should be required to police their yards, buckets, pools, gutters and ways to attract native predators.

8) Please take the comments about lobsters to heart, and please help us boost the American eel.

9) Our Stormwater systems creates a huge problem. We need better management strategies and the Towns need help and financing to do that work!

10) “Opt-in”, not “Opt-out”! Extend the date!

American eel Long version with life stages: https://www.youtube.com/watch?v=r2MBn7JTIlo
Short version eating mosquito larvae : https://www.youtube.com/watch?v=GpPpBwZ_s8A

Comments to State on Opt out application

As a VOLUNTEER local Board of Health member, I am greatly disappointed in how the State has treated us with the opt-out application for the following reasons:

1. Extensive amount of information required. This form appears designed by people who are part of the mosquito control district infrastructure. Local Boards of Health are NOT mosquito control districts, not do we aspire to be such. Our job is education and outreach, not spraying.
2. Timeframe. EEA gave NO advance notice that this application was being released and when it was released, there was very inadequate support to answer questions. We submitted questions to the opt-out email address and 7 days later had to send another email saying we did not receive a response. We got the response 2 days later. It appears EEA was unprepared yet Local Boards of Health, were expected to complete the application on a tight time schedule.
3. Level of effort required. I can't even count the number of volunteer hours spent on the application by myself, my board, and other town officials. For a small town it is totally unacceptable that the State should require this kind of effort.
4. The State is NOT transparent to residents in revealing the cost of mosquito control districts or how they are funded. If a town joins a district, the cost is NOT shown in the town's budget; it is deducted from the town's cherry sheet allotment. It appears the state is giving mosquito control districts an advantage by not disclosing the actual cost of spraying by hiding the actual costs from the residents.
5. The Harvard BOH has conducted numerous forms of outreach on all forms of public health issues for the town. If the DPH is concerned about our education and outreach, they can send a survey and we will tell them. We are NOT under EEA or the State Mosquito Control Board.
6. Mosquito surveillance, of both larvae and adult forms, is important. DPH has a network. The Central Mass Mosquito Control district conducts surveillance, but WILL NOT conduct surveillance in towns who do not want them to spray. Small towns, with limited budgets, cannot afford to conduct such an activity. DPH considers surveillance a priority item; they should be funded to establish a broader sampling network.
7. "To combat mosquito resistance, the dependency on chemical control must be addressed and lead to more sustainable methods, which include habitat modification, improved sanitation, and use of natural controls."[i]. A sustainable form of mosquito control should take precedence, not use of spraying.
8. Aerial spraying is better adapted to some geographic settings than others. The opt-out application did not provide space/ask questions about the geographic setting of the town and the appropriateness of spraying (e.g., heavy forest canopy, presence of endangered animals)
9. The opt-out form should ask one question, "Do you want your community to be sprayed?" If DPH, would like to review local boards of health educational and outreach information, they can ask for it. EEA is not qualified to review and pass judgement on public health education and outreach.

[i] *Pesticides and You,* Volume 36, No.2, Summer 2016

Cape Alliance for Pesticide Education
PO Box 631
West Barnstable, MA 02668
(508) 362-5927

A local resource for information about toxic chemical pesticides and alternatives to their use

May 4, 2021

Members of the 21st Century Mosquito Task Force:

On behalf of GreenCAPE, I would like to express concerns about the use of toxic pesticides to manage mosquitoes in MA, and urge this Task Force to develop a science-based mosquito management policy to submit to lawmakers next year--a policy that prioritizes surveillance, mosquito habitat adjustment, and public education. Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to immune and respiratory systems. The broad use of the synthetic pyrethroid Anvil 10+10 not only replaces one risk to human health with another, but creates a long-term risk to remedy a short-term problem. Beyond that, according to the Centers for Disease Control and Prevention (CDC), the use of adulticides is usually the least effective control technique.
(http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnvguidelines2001pdf)

The pesticide Anvil 10+10, sprayed from a plane or truck driving through our neighborhoods, IS harmful to humans and this exposure should be avoided. Anvil is a synthetic pyrethroid, containing sumithrin, piperonyl butoxide (PBO) and undisclosed inert ingredients. Inhaling pyrethroids can cause coughing, wheezing, shortness of breath, runny or stuffy nose, chest pain, or difficulty breathing. One exposure can create chronic asthma in a previously healthy individual. Pyrethroids have been shown in the lab to disrupt the endocrine system by mimicking the effects of the female sex hormone estrogen. Endocrine disrupters can lower the sperm count and cause the growth of abnormal breast cells. Pyrethroids also have been suspected to be a kidney toxicant, a neurotoxicant, and harmful to the thyroid. Skin contact can cause a rash, itching, or blisters. PBO prevents insects from detoxifying sumithrin, is considered more hazardous than most chemicals, can cause skin and eye irritation, and has been classified by the Environmental Protection Agency (EPA) as a possible human carcinogen. Anvil's inert ingredient polyethylbenzene (PEB) is a hazardous chemical that the EPA believes to be potentially toxic.

In 2019, at the same time several Massachusetts communities were struggling to remove PFAS from their drinking water supplies, Massachusetts aerially sprayed 2.2 million acres of the state with Anvil 10+10 and, in 2020, sprayed more than 200,000 acres.

Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS ‘forever chemicals”. Tests commissioned by Public Employees for Environmental Responsibility (PEER) on Anvil 10+10 revealed it contained approximately 250 parts per trillion (ppt) of PFOA (perfluorooctanoic acid) and 260 – 500 ppt of HFPO-DA (hexafluoropropylene oxide dimer acid, a “GenX” replacement for PFOA). When the Massachusetts Department of Environmental Protection (MADEP) was alerted of these findings, it independently tested nine samples of Anvil 10+10 from five different containers, and found eight different PFAS, including PFOA and PFOS.

https://cen.acs.org/environment/persistent-pollutants/PFAS-found-mosquito-spray-used/98/i47

The U.S. Environmental Protection Agency (EPA) has a 70 ppt Lifetime Health Advisory for PFOA and PFOS in drinking water. Massachusetts, has a much stricter regulatory limit than the EPA Advisory, i.e., 20 ppt for 6 PFAS substances combined (PFOA, PFOS, PFHxS, PFNA, PFHpA, and PFDA). PFAS are recognized to be persistent, bioaccumulative, and toxic and have been shown in the C-8 Study to be associated with a range of diseases.
http://www.c8sciencepanel.org/prob_link.html

Spraying pesticides for mosquito control may be worse than ineffective; it may even make the situation worse. Spraying can increase mosquito populations by killing off natural predators (fish, other arthropods, birds, etc.) of the mosquitoes and their larvae, thereby removing natural checks on population levels. A 1997 study looked at trends in populations of *Culiseta melanura*, the mosquito primarily responsible for transmitting eastern equine encephalitis (EEE) among birds. Over a period of eleven years, Cicero Swamp in central New York State was sprayed fifteen times with the insecticide Dibrom (naled). Instead of declining, the population of *Culiseta melanura* grew fifteen-fold during this period. The study suggests that the pesticides may have altered the ecological balance of the swamp, killing organisms whose presence would ordinarily help limit the mosquito population. (Howard, John J. and Joanne Oliver. Impact of Naled (Dibrom 14) on the Mosquito Vectors of Eastern Equine Encephalitis Virus," Journal of the American Mosquito Control Association. Vol. 13, No. 4 (December 1997), pgs. 315-325.)

Dr. Ray Parsons, of the Harris County Mosquito Control Division in Houston, observed that malathion may actually aggravate *Culex*, causing an increase in aggressive biting behavior for an hour or two after spraying. (New York Public Interest Research Group, Interview with Dr. Ray Parsons. Harris County (Texas) Mosquito Control Division. September 11, 1999.)

It has been said that “every biocide selects for its own failure." This means that mosquitoes can and will become resistant to chemical efforts to destroy them. Overuse of pesticides may create resistant “super-mosquitoes” that require ever increasingly toxic chemicals to kill them.

Finally, residents living in sprayed areas may experience a false sense of security. If they “feel” that fewer mosquitoes are in the area due to spraying, they may be less likely to use more proven measures to prevent mosquito breeding on their property and ignore or forget personal protective measures to reduce mosquito bites including the use of repellents, appropriate clothing, and avoidance of outdoor activity during twilight hours when many mosquitoes are most active.

Some agencies charged with mosquito control -such as that on Cape Cod- have discontinued fogging and aerial spraying for mosquito control because these pose an unacceptable risk to residents, farmers, and tourists. As mentioned earlier—these measures are also ineffective in that they kill only a limited percentage of mosquitoes, increase the number of mosquitoes by destroying predators, create pesticide resistance by the mosquitoes to future control efforts, and can agitate mosquitoes to be more aggressive biters. Local mosquito control puts emphasis on monitoring mosquito populations, identification and elimination of breeding sites-primarily utilizing grounds crews and larvicides- along with public education to avoid dangerous and ineffective truck-based fogging and aerial spraying. Residents and tourists alike feel assured that the Cape Cod Mosquito Control District is taking responsible action and not creating an even worse public health problem by needlessly exposing them to a mixture of harmful chemicals, not all of them identified or fully characterized with regard to impacts on human health and the environment.

We urge you to extrapolate this proactive model to other communities throughout the Commonwealth and be more diligent with early monitoring and habitat adjustment. We are opposed to adopting policy that involves automatic unnecessary spraying of mosquitoes and suggest the communities affected in the past might be better served with appropriate information on avoidance strategies and implementation of larvicidal services on known breeding sites earlier in the season ahead of a crisis.

Sincerely,

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GreenCAPE
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https://www.sierraclub.org/sierra/long-lasting-health-impacts-ddt-highlighted-new-study?utm_source=insider&utm_medium=email&utm_campaign=newsletter

Massachusetts Beekeepers Association
massbee.org
facebook.com/massachusettsbeekeepers

May 5, 2021

Re: Mosquito Spraying

Dear Members of the Mosquito Control Force for The 21st Century

As President of the Massachusetts Beekeepers Association (Mass Bee), I am writing to express Mass Bees' concerns about Mosquito Spraying. Mass Bee is the statewide organization that represents beekeepers of the Commonwealth including hobby, sideliner, commercial beekeepers and county beekeeping organizations.

Mass Bee has been a strong advocate for both native pollinators and managed bees and has worked to protect them through advocacy, legislation, and pollinator protection plans. Mass Bee is knowledgeable about commercial agricultural concerns as well as toxicity concerns of beekeepers and pollinator groups across the Commonwealth.

Beekeepers are uniquely impacted by Mosquito Spraying. Pesticide spraying can impact bees directly by killing them and indirectly by the chemicals that contaminate our honey, pollen, royal jelly, bees wax and propolis. These chemicals risk our ability to export to countries with strict limits on pesticide residues in human food and additives (honey), as is the case with Canada. Bees can also suffer sublethal effects from pesticides which do not kill them outright but instead impair bees'

health and vitality causing harm to the colony over time and decreasing productivity.

All pesticides used for mosquito spraying are highly toxic to bees and pollinators. Pesticides sprayed to kill mosquitoes can wipe out a Beekeeper's entire operation of hundreds of hives and devastate native pollinator populations with just one spraying event. Mass Bee has members who have lost hives to spraying and we are communicating their concerns to the Mosquito Control Task Force.

Honeybees are vital for crop pollination in Massachusetts. An already declining bee population has had serious repercussions on our food supply. According to the American Beekeeping Federation "Honeybees contribute nearly $20 Billion to the value of U.S. crop production. This contribution, made by managed honeybees, comes in the form of increased yields and superior quality crops for growers and American consumers. A healthy beekeeping industry is invaluable to a healthy U.S. agricultural economy. Many of the country's crops would not exist without honeybees. Crop yields and quality would be greatly reduced without honeybee pollination. Some crops, including blueberries, apples, cherries, depend on honeybee pollination". Many of our beekeepers pollinate local farms with their bee colonies and maintain food stability in our state.

Behaviors unique to bees make them particularly susceptible to spraying and include behaviors such as bees clustering outside the hives at night due to thermoregulation of the hive. This makes them more vulnerable to being killed by mosquito spraying done on humid nights. Beekeepers use different equipment and different management

styles for varroa control and honey production which influence how the bees behave and may make them more vulnerable to being impacted by a spraying event.

Mass Bee understands that certified Organic Farms are exempted from spraying in all situations but beekeepers who sell honey and bees are not exempted from spraying. Beekeeper's crops are greatly affected by insecticides as our bees may die completely and our equipment may get contaminated and be unable to be reused. Beekeepers, as well as organic farmers should be exempted from spraying in all situations.

Opting out every year and placing signs on property where beekeepers' hives are located is tedious or impossible for beekeepers. Beekeepers may have colonies on property not owned by the beekeeper and not have the ability to opt the property out as they are not the owner of the property. The beekeeper may not be allowed to place "no spraying signs or pie plates" to alert the state as to the location of their bees, as is required to be opted out. The beekeeper may live hours from where the hives are located. The opt out and posting process needs to be made easier.

Bees are often moved around for pollination and opting out at each and every location takes advanced notice and the opt out may not be effective in time to protect the bees. If someone has many bee yards or hives it is impossible to move hives quickly to protect bees from spraying with emergency notice. More notice is needed. We request at least a 7 day notice before a spraying event occurs and request that beekeepers be exempted out of spraying under all circumstances. A buffer zone of 300 feet needs to be put in place around beekeeping yards as the truck spray drifts this far and can enter the hives. To protect bees before a spraying event, hives must be moved to prevent contamination of honey and hive products and for the health of the

bees. Hives weighing hundreds of pounds cannot be easily moved without specialized equipment, trucks, forklifts, and planning. Therefore, moving bees is not a realistic expectation for beekeepers. The only option is to allow beekeepers the same protections from spraying as organic farms currently are given.

Beekeepers under pollination contract may not be able to move bees at all without violating the contract. Beekeepers who may be doing organic beekeeping practices cannot get certified by the USDA as an organic farm to protect their bees as there is currently no organic certification available for beekeeping through the USDA. This means beekeepers need to be exempted from spraying the same as organic farms are currently. Our honey, pollen, beeswax etc. can get contaminated from these pesticides which are sprayed aerially or by truck. Pesticides were found to be in hives during MDAR's own study after aerial spraying. Repeated spraying events will cause repeated build up in the hive. PFAS found in the Mosquito pesticides is highly alarming to beekeepers as it is highly toxic to the environment and not good for anyone.

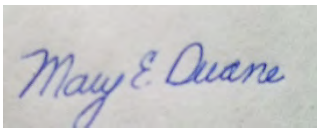
The change in the law to make it an opt out process for a town that does not want to be sprayed, instead of having a town opt in to Mosquito Spraying is alarming to Mass Bee as many towns who want to protect bees from spraying now have to jump through hoops to do it.

Furthermore, there is not enough time for municipalities to opt out of spraying by May 15.th An extension is needed for towns working to opt out to protect their pollinators and residents.

In conclusion, Beekeepers can suffer substantial economic losses from the effects of mosquito sprays. Beekeeping is the livelihood of many beekeepers in the Commonwealth. It is therefore imperative these bees are protected from Mosquito spraying and given the same

protections and exemptions from mosquito spraying as certified organic farmers. Our bees provide an invaluable service to the state and Massachusetts' local food supply depends on our bees being healthy. The Massachusetts Beekeepers looks forward to working with the Mosquito Control Force for the Twenty First Century.

Sincerely



Mary E. Duane

President Massachusetts Beekeepers Association

May 5, 2021

Mosquito Control for the Twenty-First Century Task Force
The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: May 3, 2021 Public Listening Session, Written Comments

Dear Members of the Mosquito Control for the Twenty-First Century Task Force,

We write to express our deep concern about the use of toxic pesticides to manage mosquitoes and to urge this Task Force to develop a science-based, ecological mosquito management policy to submit to lawmakers next year.

Ecological mosquito management **prioritizes preventative measures**, and includes:

- Monitoring and surveillance;
- A strong focus on public education and personal protective measures;
- Emphasis on eliminating breeding sites; and
- Consideration of local ecology.

Critically, ecological mosquito control uses a **tiered approach to managing mosquito population**s, in which:

- Non-toxic approaches, such as habitat modification must be attempted first;
- Larvaciding should be conducted based on monitoring for predefined thresholds;
- Adulticiding (spraying for adult mosquitoes) should be permitted only during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective; and
- Application of any mosquito adulticide should be the least toxic product available.

To protect health and the environment, **no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations**. Likewise, aerial spraying is ineffective, places public

health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes; and monitoring, surveillance, habitat management and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

In the event that pesticides are used under a clear public health emergency, it is critical that the Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticides used – including so-called "inert" ingredients and potential contaminants like per- and polyfluoroalkyl substances (PFAS), advance notice of any planned spraying, and universally available opt-out opportunities. Beekeepers and organic farmers should be opted-out from spraying by default, even during emergency applications. Flowing rivers, lakes and ponds (not just water supplies) with aquatic life should never be sprayed or treated with chemical additives. Fish, eels and other aquatic species feed on mosquito larvae. The chemicals in use have adverse impacts to a range of aquatic species and the residue can last at least for days in water and for weeks in the sediments. Man-made stormwater retention areas should be the focus of control.

Hazards of Mosquito Pesticides

Adulticiding operations commonly used for vector control management often employ the use of organophosphate and pyrethroid insecticides. Pesticides such as naled, malathion, chlorpyrifos, and other organophosphate insecticides are neurotoxic cholinesterase inhibitors (cholinesterase is an important enzyme needed for the proper functioning of the nervous system), causing the buildup of acetylcholine and leading to uncontrolled, rapid muscle twitching, paralyzed breathing, convulsions, and in extreme cases, death. Synthetic pyrethroids, such as resmethrin and sumithrin, used as adulticides, are associated with hormone disruption, reproductive effects, neurotoxicity, and damage to the kidneys and liver.[1] Fluorinated pyrethroids such as bifenthrin, which is used for truck spraying by some Mosquito Control Districts (MCDs), present additional risks. Bifenthrin contains a trifluoromethyl group, which would be considered PFAS according to some definitions.

Epidemiologic studies have linked pyrethroid exposure to an increased risk of autism and developmental delay in children.[2] One study conducted in central New York found that children living in ZIP codes in which aerial spraying was conducted each summer were 37% more likely to be diagnosed with autism or a developmental delay.[3]

Organophosphates have also been shown to interfere with brain development at even supposedly "safe" levels of pesticide exposure.[4] The organophosphate chlorpyrifos has been shown to impair

[1] Beyond Pesticides. 2020. Pesticide Gateway: Sumithrin and Resmethrin. https://www.beyondpesticides.org/resources/pesticide-gateway.
[2] See Utah Physicians for a Health Environment, *Mosquito Pesticide Spraying*, https://www.uphe.org/priority-issues/mosquito-pesticide-spraying/ (last visited May 4, 2021).
[3] Id.
[4] Id.

placental function and nutrient transport from mother to fetus.[5] In exposed children, chlorpyrifos is associated with brain anomalies,[6] decreased IQ and memory function,[7] and autism.[8]

These chemicals also harm pollinators and other non-target wildlife. Organophosphate spray drift can travel and impact a wide area, exposing non-target organisms and humans alike. These applications have resulted in the death of many bees and impaired bee colonies due to daytime application of malathion.[9] Studies have reported that colonies exposed to ULV organophosphates weighed significantly less for up to 28 days when compared to control colonies, indicating colony decline.[10] Scientists at the U.S. Fish & Wildlife Service recently concluded that the organophosphates chlorpyrifos and malathion are so toxic that they "jeopardize the continued existence" of more than 1,200 endangered species.[11] Mosquito control pesticides are toxic to a broad range of non-target fish, bird, amphibian, and insect species, including species that are themselves mosquito predators.[12]

Pyrethroids are frequently associated with bee kills. One study reports that after exposure to sublethal levels of a synthetic pyrethroid, worker bees failed to return to the hive at the end of day, and only 43% of these bees were ultimately able to return to the hive because of disorientation due to treatment.[13] Pyrethroids have also been found to significantly reduce bee fecundity, decrease the rate at which bees develop to adulthood, and increase their immature periods.[14]

A 2015 study finds that exposure to pyrethroids reduces bee movement and social interaction.[15] This study also found that pyrethroid-exposed bees travel 30-71% less than unexposed bees, and

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[5] M E Ridano et al., "Impact of Chlorpyrifos on Human Villous Trophoblasts and Chorionic Villi," *Toxicology and Applied Pharmacology*, August 2017, https://pubmed.ncbi.nlm.nih.gov/28549829/.
[6] Virginia A Rauh et al., "Brain Anomalies in Children Exposed Prenatally to a Common Organophosphate Pesticide," *Proceedings of the National Academy of Sciences*, May 2012, https://pubmed.ncbi.nlm.nih.gov/22547821/.
[7] Virginia Rauh et al., "Seven-Year Neurodevelopmental Scores and Prenatal Exposure to Chlorpyrifos, a Common Agricultural Pesticide," *Environmental Health Perspectives*, August 2011, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3237355/.
[8] Alice Park, "A Mother's Exposure to Pesticides During Pregnancy May Raise Children's Autism Risk," *Time*, March 20, 2019, https://time.com/5555300/pesticide-exposure-autism/.
[9] Sanford, M. Protecting Honey Bees From Pesticides. Circular 534. Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida http://pollinatorstewardship.org/wpcontent/uploads/2014/02/Protecting-Honey-Bees-Florida.pdf.
[10] Zhong H, Latham M, Hester PG, Frommer RL, Brock C. 2003. Impact of naled on honey bee Apis mellifera L. survival and productivity: aerial ULV application using a flat-fan nozzle system. Arch Environ Contam Toxicol. 45(2):216-20.
[11] Eric Lipton, "Interior Nominee Intervened to Block Report on Endangered Species," *New York Times*, March 26, 2019, https://www.nytimes.com/2019/03/26/us/politics/endangered-species-david-bernhardt.html.
[12] Celeste Mazzacano and Scott Hoffman Black, *Ecologically Sound Mosquito Management in Wetlands*, 2013, 13-23, https://www.xerces.org/sites/default/files/2018-05/13-005_01_XercesSoc_Report-Ecologically-Sound-Mosquito-Mgmt-in-Wetlands_web_0.pdf.
[13] Mullin CA, Frazier M, Frazier JL, Ashcraft S, Simonds R, vanEngelsdorp D, et al. 2010. High Levels of Miticides and Agrochemicals in North American Apiaries: Implications for Honey Bee Health. PLoS ONE 5(3): e9754.
[14] Dai, PL, Wang, Q, Sun, JH, et al. 2010. Effects of sublethal concentrations of bifenthrin and deltamethrin on fecundity, growth, and development of the honeybee Apis mellifera ligustica. EnvironTox. 29(3): 644–649.
[15] Ingram EM, Agustin, J, Ellis, MD, Siegfried, BD. 2015. Evaluating sub-lethal effects of orchard-applied pyrethroids using video-tracking software to quantify honey bee behaviors. Chemosphere, 135: 272–277.

those exposed to both the pyrethroids esfenvalerate and permethrin decreased social interaction time by 43% and 67%, respectively. None of these effects are likely to be seen as "acute" incidents post application, and thus are indicative of the need for ongoing monitoring and a focus on alternatives.

The state's current pesticide of choice, Clarke Anvil 10+10 ("Anvil"), is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Anvil contains two active ingredients – Sumithrin (d-Phenothrin) and piperonyl butoxide – both of which are highly toxic. Sumithrin exposure can result in lung irritation and has been documented to cause asthmatic responses in those exposed.[16]

Anvil's second active ingredient, piperonyl butoxide, is considered a possible human carcinogen by the U.S. Environmental Protection Agency.[17] The label for Anvil includes a box with a "Note to Physician: Contains petroleum distillate - vomiting may cause aspiration pneumonia."[18] These potential health impacts present significant concerns during the Covid-19 outbreak, as the virus attacks human respiratory systems.

There are similar concerns for Clarke's Duet product which is used by some MCDs and shares the same ingredients as Anvil but adds another pyrethroid, prallethrin.

PFAS in Mosquito Pesticides

Recently published reporting in the *Boston Globe* revealed that Anvil contains undisclosed toxic PFAS "forever chemicals."[19] PFAS are known as "forever chemicals" because they never fully break down in the environment. They are also highly mobile in water and bioaccumulative.

PFAS are toxic to humans in concentrations as small as parts per trillion ("ppt").[20] These chemicals are associated with cancer and have been linked to growth, learning, and behavioral problems in infants and children; fertility and pregnancy problems, including pre-eclampsia; interference with natural human hormones; increased cholesterol; immune system problems; and, interference with liver, thyroid, and pancreatic function.[21] PFAS have been linked to increases in testicular and kidney cancer in human adults.[22]

Alarmingly, PFAS toxicity targets the immune system. Epidemiological studies have found decreased antibody response to vaccines,[23] and associations between blood serum PFAS levels and both immune system hypersensitivity and autoimmune disorders like asthma and ulcerative

[16] National Pesticide Information Center. 2020. Sumithrin. http://npic.orst.edu/factsheets/archive/dphentech.html#references.
[17] EPA. 2018. Chemicals Evaluated for Carcinogenic Potential. http://npic.orst.edu/chemicals_evaluated.pdf.
[18] Clarke. 2020. Label Anvil 10+10. https://www.clarke.com/filebin/productpdf/anvil1010.pdf.
[19] See Abel, David. Toxic "Forever Chemicals" found in Pesticide Used on Millions of Mass. Acres When Spraying for Mosquitoes. *Boston Globe*, December 1, 2020. https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/.
[20] U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls* (June 2018), at 5–6, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf.
[21] *Id*.

colitis.[24] The negative immune system effects of PFAS are extremely concerning given the ongoing COVID-19 pandemic. Recently, the Centers for Disease Control and Prevention released a "Statement on Potential Intersection between PFAS Exposure and COVID-19," which recognized the "evidence from human and animal studies that PFAS exposure may reduce antibody responses to vaccines . . . and may reduce infectious disease resistance."[25]

Pesticide products can cause PFAS exposure in three ways: (1) active ingredient; (2) inactive ingredient; and (3) contamination from production or packaging. Many active ingredients are EPA-listed PFAS or contain EPA-listed PFAS structures, or meet other definitions of PFAS. Inactive ingredients unfortunately cannot be studied since they are almost always unlisted, but there are patents that reference PFAS chemicals as additives.

Since the *Boston Globe* first reported on the PFAS contamination in Anvil, PFAS have been discovered in additional pesticide products, including in the mosquito and tick control pesticide Mavrik, and the mosquito control pesticide Permanone 30–30 ("Permanone"), manufactured by Bayer Environmental Science.[26]

While the manufacturer of Anvil has temporarily recalled the pesticide because of PFAS contamination, this issue highlights how little the public and even state regulators know about the contents of mosquito control pesticides. The rapid pace at which PFAS have been discovered in mosquito control pesticides in the last few months suggests that this is a widespread problem across the pesticide industry. Anvil, Mavrik, and Permanone are likely only the tip of the iceberg.

<u>Unidentified Inactive Ingredients in Pesticides</u>

In addition to the respiratory irritant sumithrin and the possible carcinogen piperonyl butoxide, Anvil contains "other ingredients" that are not identified but comprise 80% of the product formulation. Anvil is not an unusual pesticide in that respect. Pesticide products are commonly made up mostly of undisclosed "other ingredients."

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[22] *Id*. at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVIRONMENTAL HEALTH PERSPECTIVES 1313, 1313 (2013), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf.

[23] Elsie M. Sunderland et. al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFASs) and Present Understanding of Health Effects*, 29 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY, no. 2, (2018), https://pubmed.ncbi.nlm.nih.gov/30470793/.

[24] *See* U.S. Environmental Protection Agency, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 39 (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

[25] Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, *Statement on Potential Intersection between PFAS Exposure and COVID-19*, https://www.atsdr.cdc.gov/pfas/health-effects/index.html (last visited Mar. 29, 2021).

[26] E.A. Crunden and Ariel Wittenberg, *PFAS in Pesticides: "A Problem of Epic Proportions"*, E&E NEWS, March 5, 2021, https://www.eenews.net/stories/1063726787; E.A. Crunden and Ariel Wittenberg, *Common Mosquito Pesticide Packed with PFAS*, E&E NEWS, March 26, 2021, https://www.eenews.net/stories/1063728605.

Notwithstanding the secrecy of these other chemical ingredients, they are not required to be tested in combination with the other active ingredients in Anvil.[27] Concerningly, Federal pesticide regulations only require reviewing the health and environmental effects of the active ingredients in product formulations.

The rapid pace at which PFAS have been discovered in mosquito control pesticides in the last few months suggests that this is a widespread problem across the pesticide industry. Anvil, Mavrik, and Permanone are likely only the tip of the iceberg. The unknowns associated with toxic mosquito control pesticides underline the need for an approach that does not place these products at the top of the toolbox. It is imperative that the Task Force account for this urgent issue of public health and environmental concern in its recommendations to lawmakers.

Any mosquito control pesticides used in the future must be tested and verified to be free from toxic PFAS. In addition, the state should require manufacturers to disclose all "inert" ingredients in their mosquito pesticides before the state will agree to purchase those pesticides for use in a public health emergency.

The Importance of an Ecological Mosquito Management Approach

Understanding the ecology of mosquito vector disease is critical to stopping the spread of arbovirus. In the case of diseases such as Eastern Equine Encephalitis and West Nile Virus, it is a certain subset of mosquitoes, known as bridge vectors, which feed on both birds and mammals, that amplify the virus and subsequently generate human infections.[28] Knowledge of disease transmission must be combined with knowledge of mosquito life cycles. Mosquitoes lay eggs in standing water that can be as small as a puddle the size of a dime. This is the best time to kill mosquitoes – when they are in a contained area, and not looking for a blood meal.

Mosquito eggs and larvae can be killed through widespread public education by encouraging residents to regularly dump out standing water and eliminate breeding sites. Sites where water cannot be drained can be larvicided. Longer-term efforts can be made to enhance habitat that promotes mosquito predators, and to move towards low-impact development.

No mosquito management approach can be successful without a robust surveillance and monitoring program. Tracking and testing mosquitoes and carriers of vector disease is a critical component to monitoring and informing the public of health implications regarding arbovirus.

While pesticides are often billed as a silver bullet for mosquito control, such claims are rarely if ever true. A program that focuses on killing adult mosquitoes after they are hatched, flying, and biting people and animals, is the least effective approach to mosquito management. It requires a knock-down rate of 90% of mosquitoes in a given area to achieve adequate control.[29] Research finds that aerosol plumes from truck mounted ultra-low volume spraying fail to make adequate

[27] Donley, Nathan. 2016. Toxic Concoctions: How the EPA Ignores Dangers of Pesticide Cocktails. Center for Biological Diversity. https://www.biologicaldiversity.org/campaigns/pesticides_reduction/pdfs/Toxic_concoctions.pdf.
[28] CDC. 2019. Transmission. EEE. https://www.cdc.gov/easternequineencephalitis/tech/transmission.html; CDC. 2018. Transmission Cycle for WNV. https://www.cdc.gov/westnile/transmission/index.html.
[29] Pimentel, David. 2004. Encyclopedia of Pest Management. https://doi.org/10.1201/NOE0824706326.

contact with target mosquitoes at the rate necessary to achieve disease reduction.[30] And while adulticides may indiscriminately reduce some level of flying insect abundance, larval mosquitoes remain.[31] What's worse, repeated spraying of mosquitoes may foster pesticide resistance.[32]

Conclusion

Business as usual cannot continue. Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which Covid-19 attacks.

We urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country. This opportunity must not be missed.

Signed,

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BEST PRACTICES FOR INTEGRATED MOSQUITO MANAGEMENT: A FOCUSED UPDATE

American Mosquito Control Association

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EXECUTIVE SUMMARY OF RECOMMENDATIONS

The mention of specific products does not constitute an endorsement by the AMCA or the steering committee.

Surveillance

Summary

- Surveillance for native and exotic species should be part of mosquito control abatement, regardless of immediate threat of disease outbreaks. Surveillance should be developed proactively to justify mosquito control funding requirements and risk for arboviral disease transmission
- Mosquito species composition should be identified at the mosquito control district level
- Egg and immature-stage surveillance
    - Oviposition cups use a variety of substrates that are placed in an artificial container, usually a small black plastic cup or jar
    - Nonlethal oviposition cups pose a risk for becoming larval development sites if left unmaintained in the field for more than a week
    - Sampling for non–container-inhabiting mosquitoes involves the use of dippers, nets, aquatic light traps, and suction methods
        - Efforts must be made to train personnel and standardize techniques to improve intersample reliability
    - For monitoring container-inhabiting *Aedes* spp entomologic indices have been the standard
        - Container indices (container index, Breteau index, House Index) may be used to determine abundance of *Aedes* spp
        - Container indices should be interpreted with caution because they may not correlate well with adult surveillance or be useful in setting nuisance action thresholds
- Adult surveillance
    - Light traps are a critical part of mosquito surveillance for a variety of species
    - Light traps are ineffective in most cases for the surveillance of *Aedes aegypti* and *Aedes albopictus*
    - BG-Sentinel™ (BGS) traps are effective for monitoring *Aedes* spp
    - Gravid *Aedes* traps are useful for surveillance of *Aedes* spp
    - Oviposition cups and BGS traps should be used together to monitor both sexes and all physiologic stages of *Aedes* spp
    - Landing rates are labor-intensive and may be associated with potential health risks to field staff in areas with known arbovirus transmissions

Mapping

- Utilize appropriate map scale to resolve mosquito aquatic habitats, adult populations, control efforts, and insecticide resistance
- Record surveillance and control data at the finest spatiotemporal resolution that is operationally feasible
- Ensure that all data are linked to spatial information for use in geographic information systems
- Quantify mosquito population sizes when possible, using standardized methods that allow comparisons among locations
- Use statistical methods only when supported by observed data; estimates based on modeling should convey the amount of uncertainty

Setting Action Thresholds

- Decisions to initiate control measures are based on analyses of larval or adult mosquito population data obtained through surveillance activities
    - The use of baseline information gathered from historical surveillance data is advisable in establishing an action threshold
- The methodology that will be used to determine if and when control measures are instituted should be based on
    - Larval stages: Dip counts or container indices*
    - Adults: Trap counts, landing rate counts (not recommended; see above), and/or number and pattern of service requests. The decision to apply adulticides must be made based on adult surveillance and not solely on weather patterns and/or temporal frequency intervals (ie, "spraying every Wednesday")
- Proactively determine threshold values that necessitate control measures
    - Action thresholds should remain flexible to adapt to nuisance levels and potential public health risks
- Thresholds for adulticiding should be the highest
- All mosquito-borne disease cases must be investigated individually, and field data and information that are collected should be used to make management decisions on best response plans

*May not correlate closely with adult catches.

Larval Source Reduction

- Source reduction is the single most effective means of vector control
- Environmental control and source reduction begin with a detailed larval survey, including key container types that serve as sources for mosquitoes
- Consider both natural and artificial containers when making efforts to control container-inhabiting mosquitoes

- Removal of conspicuous open containers may "push" *Ae. albopictus* females to oviposit in cryptic habitats; therefore, it is critical to locate and assess all potential container sources, including those that may be more difficult to identify, access, and treat with larvicides
- Detailed recommendations on large-scale environmental modifications to control freshwater and salt-marsh mosquitoes can be found in other published resources

Biologic Control

- Larger aquatic predators such as *Gambusia* spp may control mosquito larvae to some extent in permanent or semipermanent bodies of water but will not control adult mosquitoes fully
- Smaller aquatic predators (eg, predacious copepods) may control mosquito larvae that develop in containers; however, source reduction is the optimal control strategy for these species of mosquitoes
- Proper agencies must be consulted and the potential environmental impact must be assessed before any biologic control agent is released
- Bats, birds, and dragonfly nymphs are not effective as the major component of a mosquito control program

Chemical Control of Larval and Adult Mosquitoes

- Larval management
  - Choices of larvicides and pupicides are based on the individual needs of mosquito control districts
  - Factors to consider when choosing appropriate agents include efficacy, costs, and regulatory and environmental constraints
  - If practical, direct application of larvicides and pupicides should be considered as part of a comprehensive program to control container-inhabiting mosquitoes
  - Low-volume larvicides should be applied using appropriate equipment and effective droplet sizes (see summary, below). Conventional ultra-low volume (ULV) equipment is generally not appropriate for these applications
  - Hot-spot treatments reduce the time and effort needed for door-to-door campaigns in large areas; combined with use of larval surveillance techniques, aerial photography, and geographic information system modeling, these approaches have been demonstrated to be highly effective
- Adult management
  - Adulticiding should be used when deemed necessary, according to data gathered in surveillance activities or in response to public health needs
  - Efforts must be made to focus adulticide applications within intended target areas
  - ULV space sprays are the only effective means of rapidly reducing transmission risk during arboviral disease outbreaks
  - ULV applications are effective in reducing populations of adult container-inhabiting *Aedes* in peridomestic environments, even when applied at night

- Barrier and residual sprays can provide long-lasting control of adult mosquito populations
- Removal trapping may be effective but highly cost- and labor-intensive and should be reserved for use during serious outbreaks of mosquito-borne disease
- Lethal ovitraps are an effective and inexpensive method for controlling container-inhabiting mosquitoes

Monitoring for Efficacy and Resistance

- To ensure temporal and regional uniformity and to assist in the ability to compare results and assess trends, the American Mosquito Control Association recommends following the procedures for pesticide resistance testing outlined by the US Centers for Disease Control and Prevention
- Annual resistance testing should be a routine component of all integrated mosquito management programs and occur prior to the start of each mosquito season
- Resistance testing should be conducted before a product is first used
- Resistance testing should follow published protocols to provide standardized results
- A quick resistance assessment should be conducted prior to emergency adulticiding
- Assay results should be reported to MosquitoNET: https://wwwn.cdc.gov/Arbonet/MosquitoNET/

Community Outreach

General Guidelines and Objectives[1]

- **Educational resources are available from the US Centers for Disease Control and Prevention and other national organizations that can be leveraged locally (for example, view https://www.cdc.gov/zika/comm-resources/toolkits.html)**
  - These materials should be customized or accompanied by materials that describe your local situation
- Education is a continuous process that ideally begins before there is a credible public health threat
- Establish and maintain credibility and public trust by providing timely, accurate, and actionable information about what is known and what is not known
- Include adequate information to dispel rumors and misinformation
- Increase access and knowledge of accurate information about arboviral diseases among populations and community members at risk. Convey appropriate action messages for each audience
- Increase knowledge of and support for vector control activities in communities
- Increase the capacity of health care providers to share accurate health information about arboviral disease prevention to at-risk populations (eg, pregnant women and women of reproductive age, their partners, and affected populations with regard to Zika virus)

- Motivate action by community leaders and organizations to protect at-risk populations from arboviral diseases (for example, protection of pregnant women from Zika infection)
- Route public messages through the agency Public Information Officer for a consistent message

Planning an Outreach Program

- When planning an outreach program, priorities, resources, and budget should be considered:
    - What is going to make someone care about mosquito control? What is your message?
    - Have you determined who your stakeholders are (or should be)?
    - Do you know the best ways to reach and serve your stakeholders?
    - What are the motivating factors for each stakeholder to become engaged?
    - Have you identified any gaps in your message, current outreach, or use of your programs/services?
- Summarize messages with easy-to-remember phrases (ie, "The *5 P's* of Prevention")

Consider Your Stakeholders

- Stakeholders include persons, groups, or institutions that can affect or be affected by a course of action
    - Stakeholders include community residents, agencies (health departments), local and regional officials, local fire and police departments, leaders of community organizations, and the media, among others
    - Involving other stakeholders in your outreach helps to develop support for the plan and identify barriers to implementation
    - Mitigation planning should also incorporate information from scientific and technical sources and subject matter experts.

Consider Communication

- People: Stakeholders represent different groups, in terms of culture, language, race, values, education, or economics
    - Gender, age, and socioeconomic status may be risk factors for arboviral disease transmission
- Channels: Obvious channels for outreach are schools, clubs, churches, and other organizations. Also consider the following:
    - Municipal departments (such as public works, sanitation, trash removal, and building inspection)
    - "Green" organizations (focused on healthy environment and self-reliance)

    - Youth organizations (such as the Girl Scouts and Boy Scouts)
    - Social organizations (such as Habitat for Humanity)
    - Intern programs (social workers, medical personnel, biologists, etc)
    - Public health organizations (community health clinics, medical reserve corps)
    - Extension programs
    - Citizen scientists
- Live Events: Consider where a presence may be beneficial
    - Ensure a translator is on-site, if needed
    - Memorialize the event, self-promote, and spread the message after the event via recordings or pictures posted to social media; recordings of such events may be leveraged as part of public service announcements (PSAs)
- Social Media
    - Creating user-engaging content through various websites, blogs, and social media outlets to maximize reach at low cost
    - Involve social influencers: Bloggers, newspapers, and local radio/TV stations that can do periodic stories or provide 30-second reminders and PSAs
    - Research organizations or media outlets are already in existence and have an established following. Build link relationships with those sites so that your website can be easily accessed by a simple click

Formulating a Work Plan

- Outreach is an ongoing process. The link below is an example of how to create a holistic work plan for your community outreach so that measurements can be effectively gathered

Enroll America Outreach Work Plan:
https://s3.amazonaws.com/assets.enrollamerica.org/wp-content/uploads/2013/12/Enroll-America-Factsheet-HowToOutreachWorkPlan.pdf

Guidelines for Effective Outreach

Accurate, clear, and timely information is required to reduce public anxiety and give people practical and concrete steps to protect themselves. Getting the word out in a nonstigmatizing manner (educating, not frightening) is critical.

- Meet people where they are
- Be respectful
- Listen to your community

- Build trust and relationships
- Get the word out in a nonstigmatizing manner
- Offer service and information in a variety of locations (including home visits) and at nontraditional times, especially after work hours or on weekends
- Make written information friendly and easy to understand, at an accessible reading level and organized such that important information is summarized at the top of each page
- Provide information in the primary language of those who will use the service
- Adequate follow-up is critical
    - Evaluate effect of the intervention and targeted messaging
- Continually assess whether activities are meeting objectives

Record Keeping

- Operators/applicators should record the following for each application and maintain records for the time specified by the lead state regulatory agency
    - Applicator's name, address, and pesticide applicator certification number (if applicable)
    - Application date, time of day, and weather conditions
    - Product name and Environmental Protection Agency registration number
    - General location of application and approximate size of area treated (spray tracks, as recorded by an appropriate GPS system, are desirable)
    - Rate of material applied and total amount applied
- Records also must be maintained on the certification and recertification of all personnel involved in pesticide application
- Surveillance reports for disease vector and nuisance mosquito species should be maintained to promote systematic analysis of the effects of interventions; factors that should be recorded include
    - Results from mosquito egg, larval, and adult surveys
    - Records of surveillance locations and mosquito collection data
    - Records of virus testing results
    - Results of resistance monitoring of local mosquito populations
- Where possible, integrated mosquito control management systems should also include provisions for
    - Logging/tracking citizen complaints and service requests
    - Maintaining records of nonchemical interventions, including community education, door-to-door outreach efforts, waste tire removals, and container elimination campaigns

INTRODUCTION

The concept of integrated mosquito management (IMM) is central to the goal of mosquito prevention and control. The principles underlying IMM were first enumerated in 1871, but a full realization of the complexity of its components has only come about since the mid-twentieth century. The term *Integrated Mosquito Management* is derived from integrated pest management, which has been defined as a synergistic, ecosystem-based strategy that focuses on long-term suppression of pests or their damage through a combination of techniques, including biologic control, trapping, habitat manipulation, and chemical control.[2] IMM follows a similar paradigm.[3] It is a comprehensive mosquito prevention and control strategy that utilizes all available mosquito control methods, either singly or in combination, to exploit the known vulnerabilities of mosquitoes to reduce their numbers while maintaining a quality environment.

The core of IMM includes 4 critical tactics:

1. Surveillance, mapping, and rational setting of action thresholds
2. Physical control through manipulation of mosquito habitat
3. Larval source reduction and adult mosquito control
4. Monitoring for insecticide efficacy and resistance

IMM places an emphasis on flexibility and adaptability; applying any mosquito control measure on a predetermined schedule absent a documented need is not an acceptable practice. Instead, appropriately designed IMM programs are highly responsive to the local situation, being driven by demonstrated need based on surveillance data, mapping, and action thresholds, and are iteratively and actively monitored for efficacy and resistance.

Both the US Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA) recognize the need for chemical control measures for mosquitoes. IMM programs utilize public health pesticides in a targeted manner after surveillance results provide objective evidence that they are required according to established intervention thresholds, and only after the potential public health benefits have been evaluated. In this paradigm, treatments are made with the primary goal of removing only the target mosquito. The modalities for control methodologies are identified and used in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment while effectively managing mosquito populations.

In addition to causing considerable public nuisance, mosquitoes are vectors for arboviral diseases in the United States, highlighted most recently by the increasing incidence of Zika virus infections in the United States and its territories.[4] The mosquito species *Aedes aegypti* and *Aedes albopictus* are the principal vectors for chikungunya, dengue, yellow fever, and Zika

viruses.[5] Both species vary considerably in behavior from most native species, particularly with regard to feeding behavior, degree of adaptation to urban and suburban areas, and choice of habitat for oviposition; using natural and artificial water-holding containers (eg, used tires, plastic containers, gutters, and other containers abundant in the peridomestic environment) rather than permanent or transitory groundwater sources. At present, the prevention or reduction of transmission of these viruses, with the exception of yellow fever, is entirely dependent on the control of mosquito vectors and limiting person-to-mosquito contact.[6]

Along with the human health problems posed by *Ae. aegypti* and *Ae. albopictus*, various *Culex* species, including but not limited to *Cx. pipiens, Cx. tarsalis,* and *Cx. quinquefasciatus*, are vectors of varying competence for West Nile virus in the United States.[6] These and other species of mosquitoes capable of vectoring a number of viral encephalitides and parasitic worms can be successfully addressed with conventional IMM modalities.

This document represents a critical update to the 2009 American Mosquito Control Association (AMCA) Best Practices for Integrated Mosquito Management. This update was occasioned by the increasing importance of container-inhabiting *Ae. aegypti* and *Ae. albopictus* mosquitoes as vectors of human disease. In accordance with best practices, this document is based—where possible—on a comprehensive analysis of the mosquito control literature. This evidence-based structure provides a rational foundation for recommendations. With that said, it should be emphasized that this document also leverages the practical experience and best practices of a panel of vector control professionals. Conventional IMM approaches in the United States also address salt-marsh and freshwater mosquitoes—species for which the larval habitats are generally more accessible and predictable.

The recommendations summarized here are intended to be broad guidelines for integrated mosquito control. While all mosquito control programs should strive to employ the full range of IMM techniques, the AMCA recognizes that its full implementation requires a significant expenditure of resources that may be beyond the capabilities of many mosquito control programs, which are generally subject to budget and personnel constraints.

The extent and manner to which control agencies meet or exceed these best management practices should be ultimately based on the best professional judgment of mosquito control program personnel, often undertaken in consultation with local health and government authorities, in addition to available resources.

SURVEILLANCE

Summary

- Surveillance for native and exotic species should be part of mosquito control abatement, regardless of immediate threat of disease outbreaks. Surveillance should be developed proactively to justify mosquito control funding requirements and risk for arboviral disease transmission
- Mosquito species composition should be identified at the mosquito control district level
- Egg and immature-stage surveillance
    - Oviposition cups use a variety of substrates that are placed in an artificial container, usually a small black plastic cup or jar
    - Nonlethal oviposition cups pose a risk for becoming larval development sites if left unmaintained in the field for more than a week
    - Sampling for non–container-inhabiting mosquitoes involves the use of dippers, nets, aquatic light traps, and suction methods
        - Efforts must be made to train personnel and standardize techniques to improve intersample reliability
    - For monitoring container-inhabiting *Aedes* spp entomologic indices have been the standard
        - Container indices (container index, Breteau index, House Index) may be used to determine abundance of *Aedes* spp
        - Container indices should be interpreted with caution because they may not correlate well with adult surveillance or be useful in setting nuisance action thresholds
- Adult surveillance
    - Light traps are a critical part of mosquito surveillance for a variety of species
    - Light traps are ineffective in most cases for the surveillance of *Aedes aegypti* and *Aedes albopictus*
    - BG-Sentinel™ (BGS) traps are effective for monitoring *Aedes* spp
    - Gravid *Aedes* traps are useful for surveillance of *Aedes* spp
    - Oviposition cups and BGS traps should be used together to monitor both sexes and all physiologic stages of *Aedes* spp
    - Landing rates are labor-intensive and may be associated with potential health risks to field staff in areas with known arbovirus transmissions

A scientifically driven surveillance program is the backbone of every mosquito control operation. The primary purpose of mosquito surveillance is to determine the species composition, abundance, and spatial distribution within the geographic area of interest through collection of eggs, larvae, and adult mosquitoes. Surveillance is valuable for[7]:

- Determining changes in the geographic distribution and abundance of mosquito species
- Evaluating control efforts by comparing presurveillance and postsurveillance data
- Obtaining relative measurements of the vector populations over time and accumulating a historical database
- Facilitating appropriate and timely decisions regarding interventions

In addition, mosquito surveillance programs should include an ongoing component of monitoring environmental factors that can influence mosquito populations. These factors include, but are not limited to, rainfall levels, ground water levels, temperature, relative humidity, wind direction and velocity, tidal changes, lunar cycles, storm water and wastewater management, and land use patterns.[8]

Necessity for Proactive Needs Assessment

It is strongly recommended that a proactive needs assessment be developed at least annually to support funding decisions at the local level. The needs of local mosquito control agencies, which can be clearly defined based on data derived from surveillance efforts, should drive the structure, budget, and implementation of integrated mosquito surveillance programs.[8] In actual practice, budget often drives structure and implementation, with the result that mosquito control programs are funded at levels inadequate to provide comprehensive surveillance or control. Ultimately, such an approach may decrease the effectiveness of interventions and increase long-term costs.

Defining the Problem

Identification of problem species is the first step toward defining and developing control efforts.[8] Control efforts are required when a mosquito poses a nuisance or is an economic or health-related pest or vector[8]:

- Nuisance mosquitoes are bothersome in residential or recreational areas
  Mosquitoes can have a large economic impact, as they may reduce property values, slow economic development of an area, reduce tourism, or affect livestock and poultry production
- Health-related mosquito problems refer to the ability of mosquitoes to transmit pathogens that cause mosquito-borne disease

Target species identification is followed by frequent monitoring of selected areas to determine the abundance of adults and larvae.[8] Egg, larval, and adult surveys should be conducted throughout the mosquito season and should be dynamic, with the precise modalities used depending on season (for example, larval surveillance is most important in the early spring and adult surveillance during peak season). The data generated from these efforts may be used to determine both the abundance and seasonal distribution of problem species.[8]

Specimen Collection for Surveillance

The CDC light trap has been the gold standard trap for many mosquito control programs.[9] This trap was developed in the 1960s and designed for arbovirus survey purposes to make it possible to survey areas where electricity was unavailable. CDC light traps use light and carbon dioxide to attract adult mosquitoes. The gravid trap is another gold standard surveillance tool for collecting gravid females, a critical element of disease surveillance. Mosquitoes have different responses to oviposition media based on the composition of microbial fauna in the media. Grass infusion mostly attracts *Culex* mosquitoes to oviposit egg rafts,[10] and oak leaf or bamboo infusion is found to attract *Aedes*.[11] No single type of trap that provides universal performance by collecting each species in the area of interest.

Egg Surveillance

Historically, oviposition cups have provided useful data on the spatial (often in terms of simple presence or absence) and temporal (seasonal) distributions of container-inhabiting mosquitoes.[12] Although oviposition cups are valuable for determining the presence and absence of *Aedes* vectors, they are not always reliable for adult population estimation. For this reason, collections should be made and assessed in tandem with adult data.[12] Focks and colleagues discussed the problems of using data derived from oviposition cups, emphasizing the effect of skip oviposition behavior in some *Aedes* species and competing containers.[13] Based on experience in urban New Jersey, the number of eggs in oviposition cups does not correlate with the number of females, especially during dry summers. Conversely, Suter and investigators showed that egg data were useful to determine efficacy of intervention methods they employed, and determined 2.26 times higher egg density in control compared to intervention site[14]; their findings are in agreement with studies conducted in Italy.[15,16] Based on conflicting results between eggs and adult populations of *Aedes* mosquitoes, caution is warranted when considering either or both of these surveillance methods.

Many techniques are available to sample mosquito eggs.[12,14,17] These methods have, traditionally, been infrequently used as a primary surveillance system for native mosquito species, as they are highly labor-intensive.[8]

Oviposition cups are small, generally dark-colored containers that contain water and a partially submerged substrate on which female mosquitoes lay their eggs.[5,10] Water with organic infusions (hay, grass, or leaves) is, in many cases, more effective than tap water alone.[10,18] Oviposition cups are inexpensive and easily deployed; adequate sampling requires routine trapping at sites representative of the habitats in the community. Lethal oviposition cups are available.[19] Nonlethal oviposition cups are also available but should not be left unmaintained (infusion and substrate changed and reset) for more than a week at a time due to the risk for production of adult mosquitoes.[5]

Oviposition cups have a number of potential limitations.[5] First, the data generated must be interpreted with caution because oviposition cups compete with natural larval habitats, presenting a problem, particularly after source reduction campaigns.[5] Second, microscopy may be needed to accurately count eggs, especially if debris is present on the oviposition surfaces. Third, trained personnel are required to hatch, rear, and identify species.[5]

Larval and Pupal (Immature Stage) Surveillance

Mosquito larvae and pupae can be collected with dippers, nets, aquatic light traps, suction devices, and container-evacuation methods, and are measured in terms of number of larvae

per dip.[8] There is no "standard dipper" or "standard dipping technique"; as such, dipping as a sampling method is somewhat unreliable, as collectors must account for differences in the capture environment, mosquito submerging behavior, and stage differences, among other factors.[8] Thus, training, practice, and experience are critical for control programs that use larval density routinely to determine control measures.

Vector monitoring for container-inhabiting *Aedes* has traditionally relied on sampling of immature stages, such as larvae or pupae[20]; however, *Aedes* species present particular challenges for immature-stage surveys.[5] Because water-holding containers come in a wide variety of types, sizes, and shapes, standard dipping equipment is often unwieldy and ineffective. However, a dipper can still be used for deep containers (such as recycling bins), and a suction device (such as a turkey baster) can be used for slender containers (such as hollow fence posts and narrow tires).

Indices that have been used to quantitate *Aedes* include

- The House Index (the percentage of houses that are positive for larvae)
- The Container Index (the percentage of water-holding containers that are positive for larvae)
- The Breteau Index (defined as the number of mosquito-positive containers per 100 houses).

It should be noted that immature container indices have failed to correlate well with adult catches in BG-Sentinel™ (BGS) traps, nor do they appear to correlate with episodes of nuisance action thresholds.[21] Unlu and colleagues found that, although basic larval indices did not correlate with local adult abundance, a significant correlation was observed when only key positive containers were used for calculation of indices.[21]

Adult Mosquito Surveillance

Adult mosquito monitoring is a necessary component of surveillance activities and is directed toward identifying where adults are most numerous. This information drives response to service requests and helps determine whether interventions (source reduction, larviciding, and/or adulticiding) are effective.[8]

Traps are an integral part of a comprehensive mosquito monitoring program.[22] There are a number of useful traps available for monitoring mosquito populations, including the New Jersey light trap (NJLT), portable carbon dioxide encephalitis vector survey trap, ABS trap, CDC light trap, Mosquito Magnet® X (MMX) trap, BGS trap, Fay-Prince trap, propane-driven traps, gravid, resting boxes, and pigeon- or chicken-baited sentinel boxes. Community nuisance complaints are also useful for surveillance.

The NJLT, long considered the gold standard of traps, employs light and is useful for measuring the relative abundance of certain mosquito species, although many insects other than mosquitoes are attracted to these traps.[8] CDC light traps, miniature versions of the NJLT, operate on battery power and can be used anywhere. Mosquito collection numbers may be enhanced with a secondary mosquito attractant, such as carbon dioxide, octenol, or BG-Lure (composed of ammonia, caproic acid, and lactic acid).[23] Truck traps, aspirators, and MMX traps have been used for adult mosquito surveillance.

A different situation pertains to *Ae. aegypti* and *Ae. albopictus*, which are not efficiently captured by commonly used mosquito traps, such as the CDC light trap or NJLT.[5] Although larval surveys have been the standard for monitoring these species, a greater emphasis is now being placed on monitoring adult populations to provide a more direct assessment of the impact of interventions.[20] At present, BGS traps, as well as the gravid *Aedes* Trap (GAT) and CDC-autocidal gravid ovitrap (CDC-AGO), are the most widely used.[5,19,24] A study compared the BGS trap and GAT for monitoring female *Ae*. *albopictus* and concluded that they are best used as complementary approaches to monitor both sexes and all physiologic stages of female *Ae*. *albopictus*. Although the GAT collected lower numbers than BGS, except for one study location, the versatility and lower cost of the GAT suggests that it is a useful and viable alternative to the BGS trap.[20] CDC-AGO traps are relatively new and studies have been conducted to determine their efficacy for surveillance and control.[19]

It is clear that differences exist in collection efficacy for *Aedes* among traps. A study conducted in 2004 compared 7 traps, including the CDC miniature light trap (with and without light), Fay-Prince trap, an experimental moving-target trap, the Mosquito Deleto™, DragonFly®, and Mosquito Magnet® Liberty traps, for monitoring *Ae*. *albopictus* and *Ae*. *aegypti* originating from a large tire repository in Texas.[25] Among the traps tested, the Mosquito Magnet collected significantly higher numbers of females of these 2 species. The Fay-Prince and DragonFly traps collected the second-highest number of mosquitoes. In terms of *Ae. albopictus* capture, no significant differences existed between DragonFly, CDC without light, and CDC with light captures, which were significantly different from Mosquito Deleto. No statistical significance existed between moving-target, Fay-Prince, CDC traps with light and no light for *Ae*. *aegypti*, and Mosquito Deleto traps.

BGS traps are effective in collecting *Ae. aegypti* and *Ae. albopictus*.[5,26-32] They are routinely used in the monitoring of these species and may have applications in control (discussed later in this document). These collapsible, lightweight traps use visual and olfactory lures to enhance collection and also have the advantage of collecting adult females across physiologic states[5,26-28] Although effective, BGS traps are expensive and must be properly maintained[33] and protected

against vandalism or damage from wildlife or pets. Care must be taken to select appropriate sites to optimize collection and protect the trap.

Case Study: Efficient and Effective Use of BGS Traps for Surveillance

To expedite selection of *Ae. albopictus* trapping locations during an area-wide project for suppression, Unlu and colleagues selected 4 sites for surveillance.[33] Sites were chosen because of past requests for service related to *Ae. albopictus* and abundance during routine disease and nuisance surveillance.

Each site, including about 1000 individual parcels, was approximately 0.6 x 0.6 km and all were situated at least 0.5 km apart. Each established site was separated into grid cells using natural boundaries and assigned a unique identification number. The mean number of parcels in each cell was estimated with aerial imagery and a parcel layer in ArcMap 9.2™. The authors sampled randomly and weekly across a predetermined grid of cells that included several parcels. This protocol allowed the authors to utilize the BGS traps within the entire sampling site and estimate the abundance of *Ae. albopictus* at each study site. Each week, an Excel® random number generator was used to select cells for sampling. The first 9 randomly generated numbers were assigned to trapping locations at each site (4 sites x 9 traps). The number of available traps determined how many cells were sampled each week within each site. The cells were displayed on the parcel layer so an address for each parcel and features such as roads, schools, and parks that served as visual limits for the trapping location and cells could be properly identified by field crews. The method of proactively identifying trapping site locations outlined above allowed inspectors to locate trapping sites and alternatives quickly and accurately.

Access into residential parcels to deploy traps in urban environments is often difficult because residents are often not home during the day, parcels may be locked or gated, residents may own guard dogs or others pets, or residents are apathetic toward government employees; parcels may be abandoned and pose physical structural hazards or harbor squatters. The authors acquired permission from residents before BGS traps were placed. A notice with a detailed explanation about their surveillance efforts and contact information was placed for residents who were not home during the pretrapping site visit.

The authors experienced a low rate of refusal (≈5%) in the city of Trenton, New Jersey. To increase contact with residents who may have been at work between 7:30 AM and 3:30 PM, staff worked from 4:00 PM to 8:00 PM. Residents were also asked to leave their property unlocked and keep pets indoors during the sampling period. Although compliance was high, if residents did not grant permission, another nearby parcel was quickly chosen. Social apathy or refusal

based on government affiliation was not a major concern during surveillance. In general, residents in lower socioeconomic areas welcomed attention. In fact, several residents became interested in the project and regularly asked about the mosquito counts in their own yards and community.

Abandoned parcels posed a problem during these investigations. Neglected and vacant parcels often were dangerous for field crews because of falling structures and other physical hazards, and high rates of squatting increased the rates of trap vandalism. To avoid losing data and expensive BGS traps, they were placed only within occupied parcels.

Most mosquitoes avoid direct sunlight and wind, thus BGS traps should be placed in shaded and sheltered areas. However, heavily urbanized locations may have fewer shaded habitats compared to suburban neighborhoods. If a parcel did not include shade from vegetation, traps were placed in shade created by infrastructures, such as an alcove between adjoining duplexes or row homes. Temperature and humidity also affect success, so if a parcel did not have a suitable location for trap placement, an alternative parcel was used. Because the BGS trap attracts *Ae. albopictus* visually as well as with the lure during operation, traps were not covered during sampling. Traps were operated weekly for 24-hour periods, depending on weather conditions. On the whole, mosquito inspectors located suitable shaded habitats within most preselected parcels, and rainfall did not affect trapping surveillance.

Oviposition cups such as the GAT use organics in water to capture gravid female mosquitoes, including those that have the potential to transmit arboviruses.[8,34] Because females collected by these traps have already blood fed, and thus have a greater probability of an arbovirus being present in their salivary glands, they are useful for ongoing risk assessment.[8] The ovilures used should be tailored to the problem species to enhance catches (for example, hay infusion for *Cx. quinquefasciatus*, alfalfa infusion for *Ae. aegypti*, and oak leaf infusion for *Ae. triseriatus)*.[8] Autocidal gravid traps (discussed below) have been used to control and prevent outbreaks of *Ae. aegypti*.[10,34] Gravid traps are considerably less expensive and easier to use than BGS traps.[34] Ideally, GAT and BGS traps should be used in a complementary way to monitor both sexes and all physiologic stages of *Aedes*.[20] Eggs must be hatched and reared for accurate identification.

Nonlethal oviposition cups should not be left in the field for more than 1 week to 10 days without maintenance due to the risk that they may become a potential larval development site.[35] Issues associated with oviposition cups include correlating adult female counts from egg numbers and the propensity of invasive *Aedes* to exhibit skip-oviposition.

Aspirator devices, such as sweepers, suction traps, and hand-held battery-operated flashlight aspirators, may be used to collect resting mosquitoes on either natural resting harborage or artificial resting structures.[8] Mosquitoes enter the resting box traps in the morning; collection by aspirator is conducted in mid morning to late afternoon when the mosquitoes are inactive.[8] Because adult mosquitoes are collected across a variety of physiologic states (unfed, blood-fed, gravid, males and females), collecting resting mosquitoes has the advantage of providing an accurate representation of the overall vector population.[5,36] Aspirators also have utility in collecting mosquitoes indoors.[5] Although efforts can be made to standardize indoor sampling, there is often substantial variability in the number of mosquitoes collected at each location; thus, sampling large numbers of houses in a short period of time (100-200 houses per neighborhood) is required.[5] Because most locations harbor low densities of mosquitoes, and because there is a wide variety of potential resting sites, outdoor sampling with mechanical aspirators is difficult to standardize and labor-intensive; further, sufficient sample sizes are frequently difficult to obtain.[5] The CDC-Backpack Aspirator has been widely used for indoor collections of certain domestic mosquito species, including *Aedes*; however, it has a number of limitations, including weight and cost. As an alternative, a less expensive, battery-powered, relatively light aspirator, the ProkoPack™, has been developed that efficiently collects adult mosquitoes.[37]

Landing and Biting Counts

Although not recommended by the CDC, many mosquito control programs utilize landing rates for measuring adult mosquito activity.[8] This measure simply quantifies the number of mosquitoes that land on a person in a predefined time period. While effective, landing rates are labor-intensive and may be associated with potential health risks to field staff in areas with known arbovirus transmission. The CDC does not recommend the landing rate technique for this reason.[5]

If landing rates are used, variables to be taken into account include[8]

- Time of observations
- Duration of observations
- Portion of subject's body observed for landing mosquitoes
- Number and type of nearby habitats
- Number of subjects used

Landing protocols must be standardized to acquire meaningful data; they are most effective when the same subject performs repeated measures at a given site, as there is considerable interindividual variability in attracting and collecting specimens.[8]

Handling of Field-Collected Mosquitoes

Disease surveillance relies on detection of arbovirus in collected mosquitoes through detection of proteins, RNA, or disease-causing organisms. Therefore, it is critical that collected mosquitoes be handled in a manner that minimizes exposure to conditions that could degrade the virus, such as heat or successive freeze-thaw cycles. The CDC recommends the following steps for mosquito samples intended for testing[5]:

- A cold chain should be maintained from the time mosquitoes are removed from traps to the time they are delivered to the processing laboratory and through any short-term storage and processing
- Mosquitoes should be transported from the field in a cooler with either ice packs or dry ice
- Mosquitoes should be sorted and identified on a chill table or tray of ice, if available
- Pooled samples should be stored frozen, optimally at -70°C, but temperatures below freezing may suffice for short-term storage

Typically, mosquitoes are tested in pools of fewer than 50, and only female mosquitoes are tested in routine arbovirus screening programs.[5]

MAPPING

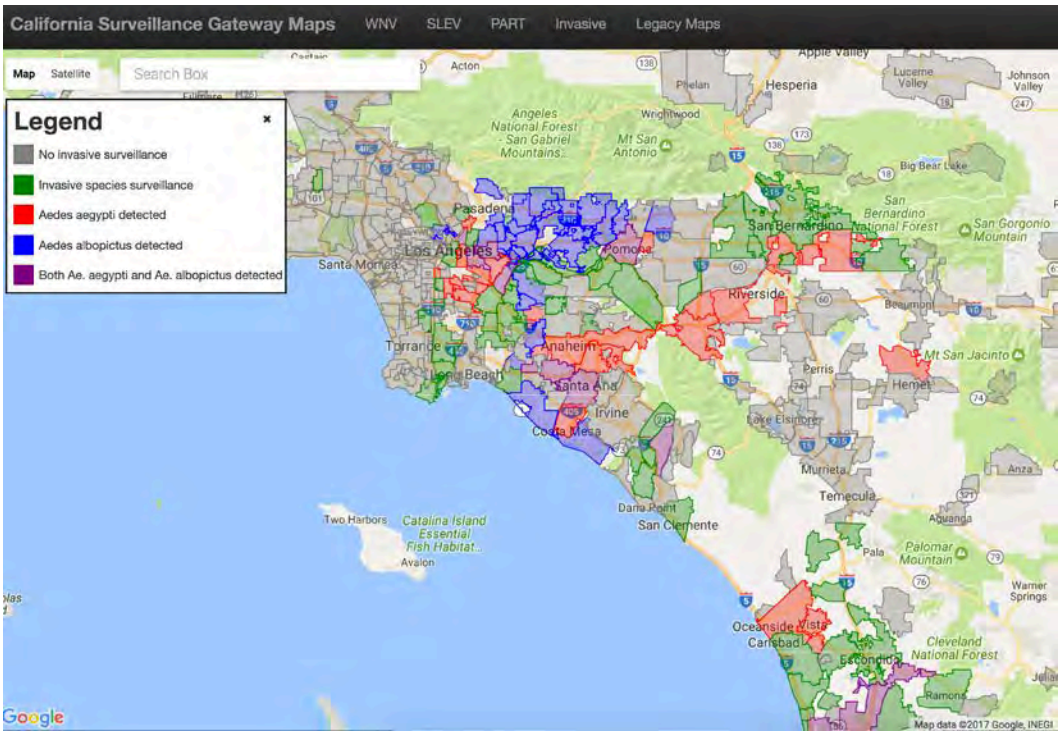
Summary

- Utilize appropriate map scale to resolve mosquito aquatic habitats, adult populations, control efforts, and insecticide resistance
- Record surveillance and control data at the finest spatiotemporal resolution that is operationally feasible
- Ensure that all data are linked to spatial information for use in geographic information systems
- Quantify mosquito population sizes when possible, using standardized methods that allow comparisons among locations
- Use statistical methods only when supported by observed data; estimates based on modeling should convey the amount of uncertainty

Mapping and analysis of spatial data with geographic information systems (GIS) are essential elements of modern mosquito surveillance and control programs. GIS enables decision makers to capture, manage, display, and analyze large quantities of spatial and temporal data in a geographic context. Coupled with remote sensing and decision-support system technologies, GIS provides a powerful platform that can be used not only to enhance surveillance and direct field operations,[38] but also to provide evidence needed to educate the public, government, funding bodies, and other stakeholders.

The routine use of GIS provides many operational advantages for control of invasive mosquitoes[39]:

- Documentation of larval and adult mosquito sources
- Documentation of service requests received from the public
- Visualization and analysis of mosquito distributions and abundance
- Documentation of surveillance and control efforts
- Identification of “hot spots” of mosquito activity or pathogen transmission risk
- Prediction of locations and seasons that are most suitable for invasive mosquitoes
- Resolution of insecticide resistance patterns
- Provision of high-quality printed and digital maps for operational use and education
- Generation of resident lists in specific high-risk areas for targeted notifications or door-to-door surveys
- Enhanced collaboration with other agencies to communicate intentions and coordinate actions across jurisdictional boundaries



California Vectorborne Disease Surveillance System. CalSurv Gateway Maps: Invasive Aedes. 2017; http://maps.calsurv.org/invasive. Accessed January 18, 2017.

There are 3 components involved in the development and application of a GIS[40]:

1. Data acquisition and management
2. Visual presentation
3. Statistical analysis

Spatial data consist of information recorded by mosquito control programs as well as base map layers that provide context. Such data may be acquired by several means. Existing maps or aerial photographs may be digitized and imported into a spatial database. Public domain maps are available on the Internet for all major metropolitan and suburban regions in the United States. Numerous software packages make presentation and basic analyses of spatial data relatively easy (Table 1).[40]

For GIS to be useful for mosquito control, one must first think carefully about the scale at which data are to be recorded, analyzed, and mapped.[38] To the extent that resources allow, it is best to record surveillance and control data at the finest resolution possible to allow for later analyses that may not be foreseen at the time of data collection. Ideally, spatial data should be collected at the level of individual collection locations, sources of larval or adult mosquitoes, or specific locations where control measures have been implemented. Many locations will be recorded as points (eg, trap locations or household inspections), whereas others may be more

appropriately recorded as lines (eg, truck-mounted insecticide application routes) or polygons (eg, aerial treatment areas or large larval sources). Spatial data and derived maps can be used as appropriate in the Pesticide Discharge Management Plan.

The use of maps to understand spatial patterns is a simple, straightforward approach to data analysis, as spatial patterns may be self-evident when presented on a map using color gradients, differently sized symbols, or contours. Raw data from trap or control efforts can be mapped directly in GIS software, which can clarify patterns in trap counts or control efforts rapidly without the need for intermediate decisions or other analysis. Superimposing layers on base maps with other geographic features is a qualitative but powerful way to provide data to operational personnel or the public.

In addition to mapping raw data, it is often necessary to perform data analyses that integrate the information from one or more elements of mosquito surveillance and control programs. Spatial tools can provide useful indications to help prioritize public mosquito control measures in areas where nuisance, human-mosquito contact and risk of local arbovirus transmission are likely to be highest. This may include using simple risk models to integrate several surveillance data sets[41] or spatial analyses that help to clarify the relationship between multiple layers of spatial data. For example, GIS has been employed in many areas to understand local factors associated with *Aedes* distribution and abundance.[5,7,8,42-46] More formal data analysis can also be done by modeling, integrating GIS data with standard statistical or mathematical models that capture the dynamics of mosquito populations or pathogen transmission.[47,48] Detailed description of methods for spatial data analysis is beyond the scope of these recommendations.

Operationally, GIS software serves as a spatial toolbox to estimate distances, conduct buffer analyses within special radii, or perform spatial queries that combine data from multiple sources. Results of spatial analyses then can be presented in the form of maps indicating areas of high mosquito abundance or pathogen transmission risk as targets for mosquito control.

For *Ae. albopictus* and *Ae. aegypti*, projected habitat suitability and risk maps have been developed,[49-54] and these are useful at broad scales to guide surveillance or to predict arbovirus transmission risk.[55,56] This is particularly true in temperate habitats where the continued expansion of these species is associated with new public health concerns.[57] Such modeling can be used on a broad scale to predict geographic trends over time, but it also has utility at finer local scales. For example, in areas permanently colonized by *Aedes* species, it is critical to identify potential spatial and temporal hot-spots that may be associated with higher nuisance biting and risk for disease transmission in order to prioritize mosquito control interventions.[42]

Regardless of the GIS or modeling approach taken, it is critical to evaluate the local environment and validate predictions with accurate field entomologic data. The heterogeneity

and ubiquity of the larval habitats of *Aedes* species require increased accuracy in predictions so that public health agencies can allocate the most rapid and effective control methods within funding and resource limitations.

Web-Based Mapping and Data Sharing

Online platforms provide powerful opportunities to provide interactive maps to a range of users, from mosquito control professionals to the public, by extending desktop GIS. These systems require back-end GIS expertise to define and maintain the online maps, and ideally they allow end-users to explore spatial data without the need for specialized GIS training.

As a complement to local use of GIS, centralized data management platforms provide the ability to produce state or national maps of invasive mosquitoes or emerging mosquito-borne disease threats. One such system is the CalSurv Gateway, which has been California's official data management system for mosquito and arbovirus surveillance since 2006. Many tools for spatial queries and other calculations are available to registered users, and public-facing online maps provide an overview of *Aedes* surveillance in each city (http://maps.calsurv.org/invasive). Users can click through to local mosquito control agency websites for more information on their city.

The recent emergence of Zika virus as a public health threat to the United States has highlighted the need for a national distribution map of *Ae. aegypti* and *Ae. albopictus.* To address this need, the CDC has established MosquitoNet, a national repository of collection data for these species to inform mosquito control and public-health decisions. This system will complement the ArboNet system, which tracks cases of arboviral diseases and other surveillance data for the United States (https://diseasemaps.usgs.gov/mapviewer/).

Table 1. Examples of Common Software for Use in GIS

Name	Functionality	Provider	Website
ArcGIS	Full-featured GIS (desktop or online)	Environmental Systems Research Institute (ESRI)	http://www.esri.com/software/arcgis
QGIS	Full-featured GIS (desktop or online)	QGIS Development Community (open-source)	http://qgis.org/
GRASS GIS	Full-featured GIS (desktop)	GRASS Development Team (open-source)	https://grass.osgeo.org/
PostGIS	Spatial database management system	PostGIS Development Community (open-source)	http://www.postgis.net/

GIS, geographic information systems.

SETTING ACTION THRESHOLDS

Summary

- Decisions to initiate control measures are based on analyses of larval or adult mosquito population data obtained through surveillance activities
    - The use of baseline information gathered from historical surveillance data is advisable in establishing an action threshold
- The methodology that will be used to determine if and when control measures are instituted should be based on
    - Larval stages: Dip counts or container indices*
    - Adults: Trap counts, landing rate counts (not recommended; see above), and/or number and pattern of service requests. The decision to apply adulticides must be made based on adult surveillance and not solely on weather patterns and/or temporal frequency intervals (ie, "spraying every Wednesday")
- Proactively determine threshold values that necessitate control measures
    - Action thresholds should remain flexible to adapt to nuisance levels and potential public health risks
- Thresholds for adulticiding should be the highest
- All mosquito-borne disease cases must be investigated individually, and field data/information that is collected should be used to make management decisions on best response plans

*May not correlate closely with adult catches.

Decisions to initiate control measures should be based on an analysis of either larval or adult mosquito surveillance or other available field data, as outlined earlier. Programs must establish a mechanism on which decisions to institute control measures are based.[3]

Mosquito control districts should proactively determine the methodology that will be used to determine if and when control measures are instituted. For larval stages of all mosquito species, the standard methodology consists of numbers of larvae and pupae observed in a standard "dip count." Other surveillance and action thresholds may incorporate measures such as the house, container, and/or Breteau indices, or even an egg (ovicup) index. For adults, thresholds may be set based on the number and pattern of service requests, collection rates, or landing rates.

Threshold values for initiating chemical control measures should remain flexible to adapt to nuisance levels and potential public health risks.[3,8] Emergency response plans, including appropriate action thresholds, are valuable in situations when issues of public health are

involved.[8] In general, adulticiding should be considered when other control methods are not feasible or have failed previously.[8]

Special considerations pertain to *Aedes* species when setting action thresholds. *Ae. aegypti*, in particular, has a short flight range. As such, large numbers of adult trapping sampling stations are needed to assess adult populations within a local or regional area, which is often impossible for many mosquito control districts. Further, larval indices do not correlate well with adult catches.[21] *Ae. aegypti* has a "nervous" flight/biting behavior and is capable of biting several people in a short period of time. Thus, current entomologic indices may not reliably assess biting or disease transmission risks. In these cases, consideration should be given to setting action thresholds as low as reasonably possible in consideration of disease transmission potential, public service requests, and economics of spray decisions.

Setting a realistic trigger or action threshold for management decisions is highly specific to each mosquito program and must be tailored according to local administrative codes, public acceptance, and public health threat. The CDC has provided guidance on factors to consider when setting action thresholds with regard to Zika virus transmission risk (Table 2).[1] In cases where introduced travel-related or sexually transmitted cases have been reported (Phase Level 1 according to the CDC scheme), it is appropriate to initiate a multimodality adult and larval vector control strategy at and around the site of the case.[1] In cases where there is a suspected or confirmed local transmission or confirmed multiperson local transmission (Phases 2 and 3 in the CDC scheme) immediate vector control actions are warranted.[1] The complete CDC Interim Response Plan is currently available at https://www.cdc.gov/zika/pdfs/zika-draft-interim-conus-plan.pdf.

Table 2. Centers for Disease Control and Prevention Risk Categories for Zika Virus Transmission[1]

Stage	Phase Level	Transmission Risk Category
Pre-incident	**0**	**Preparedness** – vector present or possible in the state
	1	**Mosquito season** – *Aedes aegypti or Aedes albopictus* mosquito biting activity; introduced travel-related, sexually or other body fluid–transmitted cases
Suspected/ confirmed incident	**2**	**Confirmed local transmission** – single, locally acquired case or cases clustered in a single household occurring <2 weeks apart
Incident/response	**3**	**Confirmed multiperson local transmission** – Zika virus illnesses with onsets occurring ≥2 weeks apart but within an approximately 1-mile diameter

All mosquito-borne disease cases must be investigated individually, and field data and information that are collected should be used to make management decisions on best response plans.

All cases are different, and responses must be tailored to the information at hand. Described below are 3 imported Zika cases reported to the Manatee County Mosquito Control District, the field information collected and subsequent response.

Case Studies

Case 1: A middle-aged woman had returned from a Caribbean island vacation in July 2016 and complained to her doctor of feeling ill. The local health department determined the illness to be related to a Zika infection, and the local mosquito control district was notified the same day. The field investigation determined that the patient resided in an affluent, gated neighborhood with a very active homeowners association. No adult *Ae. aegypti* or *Ae. albopictus* larvae were found in the course of an hour-long search over a one-quarter mile radius around the patient's home. No mosquito source containers were located. Since the risk of local disease transmission was very low, no additional control measures were taken.

Case 2: A teenaged boy had returned within his family from a Caribbean vacation, became ill, and was determined to have a Zika infection. Like case 1, the boy resided in an affluent neighborhood and a field investigation found no adults or larvae within the community. However, the boy was active in extracurricular school activities. An investigation around the high school found numerous *Ae. aegypti* and *Ae. albopictus* breeding habitats, as well as some adults of each species. These larval habitats were quickly eliminated; the school's maintenance crew was educated; and a handheld fogger was used to kill the few adults that were found around the agricultural club and athletic fields, which harbored tires used for football practice.

Case 3: A 35-year-old woman returned from visiting extended family in Honduras. After returning home, she felt ill but delayed seeking medical attention. After a week of being ill, she presented to a medical clinic where her state department of public health determined that she had been infected with Zika.

Field investigation found this to be a "worst-case scenario." She resided in a high-density community trailer park. Laundry was often done outdoors, and gray water was openly discharged. Garbage and refuse had accumulated throughout the trailer park. Virtually every home had some degree of mosquito activity, with some homes having hundreds of individual sources (containers). Adult *Ae. aegypti* were present in high numbers. Further, the community of 70 trailers included 4 to 5 "social" areas where residents would gather after work and into the evening.

In response, the mosquito control district quickly assembled 14 employees, who were divided into 4 teams, with each team responsible for 1 section of the community. The response included source reduction of larval habitats; application of chemical larvicides to habitats that could not be eliminated; application of ultra-low volume adulticides via handheld foggers throughout the community and targeted shaded areas; application of long-lasting barrier sprays to hedge rows, shaded areas, and community social gathering sites; and active Zika-prevention education of the residents using bilingual employees and door-hanging leaflets. The area was inspected again 1 day later and again at days 3 and 7. No additional larvae or adults were found. Aerial applications of larvicides and adulticides were considered but were not used, given the apparent success using the approach described earlier. In addition to the 70 trailers within the community, a neighboring community of single-family homes was also inspected and treated similarly.

LARVAL SOURCE REDUCTION

Summary

- Source reduction is the single most effective means of vector control
- Environmental control and source reduction begin with a detailed larval survey, including key container types that serve as sources for mosquitoes
- Consider both natural and artificial containers when making efforts to control container-inhabiting mosquitoes
- Removal of conspicuous open containers may "push" *Ae. albopictus* females to oviposit in cryptic habitats; therefore, it is critical to locate and assess all potential container sources, including those that may be more difficult to identify, access, and treat with larvicides
- Detailed recommendations on large-scale environmental modifications to control freshwater and salt-marsh mosquitoes can be found in other published resources

Larvae of all species of mosquitoes develop in water. Particular species of mosquitoes are adapted to certain types of aquatic habitat, such as pools or ponds of fresh or brackish water with characteristic vegetation, flooded ditches, and small containers of water. To prevent mosquito production, larval source reduction is the most effective means of vector control.[7,58] Larval source management (LSM) involves the removal, modification or treatment, and monitoring of aquatic habitats to reduce mosquito propagation and human-vector contact. Interventions for LSM range from simple—draining aquatic sites or treating them with larvicidal chemicals and removing water-holding containers capable of producing mosquitoes—to complex, such as implementing Rotational Impoundment Management or Open Marsh Water Management techniques.[8]

Detailed recommendations on large-scale environmental modification for the control of freshwater and salt-marsh mosquitoes are beyond the scope of these recommendations (a detailed summary of such methods can be found in the Florida Mosquito Control Handbook).[8] Briefly, source reduction in freshwater habitats (eg, floodplains, swamps, and marshes) typically involves constructing and maintaining channels. These channels or ditches can serve the dual functions of dewatering an area before mosquito emergence can occur and as harborage for larvivorous fish. Ditching and impoundments may be used for salt marsh source reduction. Mosquito production from storm water/wastewater habitats can be a problem but typically can be managed by keeping the area free of weeds through an aquatic plant management program and by maintaining water quality that can support larvivorous fish. Large-scale environmental modification requires close cooperation with local, regional, and national government, and must be conducted with a clear understanding of the potential environmental impact on target and nontarget species.

Source reduction, if carried out comprehensively, is clearly the single most effective control method against container-inhabiting *Aedes* species.[1,59] However, this method is operationally difficult to implement and sustain. Container removal programs and so-called "tip-and-toss" techniques (overturning containers holding water) are effective in eliminating habitat and may be combined with direct larvicide treatments.[35] Given the large number of potential container sources (Table 3) and circumstances where many of these containers are situated on private property, this approach may have only limited success while being labor-intensive and time-consuming, requiring public education efforts (addressed separately in this document) and close cooperation with the community.

Such programs have met with varied success. In central New Jersey, *Ae. albopictus* populations were suppressed (75% fewer adults) by combining source reduction efforts with ultra-low volume (ULV) adulticiding.[60] In China, daily source reduction in a recreational area resulted in only 50% reduction of *Ae. albopictus* for only 2 to 3 weeks.[61] Another study, conducted in Peru, achieved only a 15% reduction in *Ae. aegypti* populations; however, this study targeted only the most productive containers.[62]

Containers harboring *Aedes* can be either natural (eg, tree holes, pitcher plants) or artificial (eg, tires, cemetery vases), and both represent significant sources of disease vectors.[63] Identification and elimination of standing container water sources—even if small—is a critical element of *Aedes* control. A study in a typical New Jersey inner-city urban neighborhood showed that the most abundant containers with *Ae. albopictus* were small trash items (46.5%) and the least abundant were tree holes (0.1%), which were the only natural containers.[21] Other abundant containers included plastic buckets (7.2%), bowls (2.8%), tarps (2.7%), and tires (2.8%). Of the more than 20,000 wet containers inspected, only 2.8% were found to be positive for mosquito larvae, predominantly *Ae. albopictus* (42.3%). It is important to emphasize that containers harboring *Aedes* may not be just "trash"—many of these containers are in use by homeowners (eg, for recycling or water storage) and, thus, cannot simply be eliminated. Where feasible and acceptable, proactively drilling drainage holes in such containers may provide considerable benefit.

The variety and abundance of *Aedes* larval habitats (Table 3), along with their frequent identification in obscure and inaccessible locations (eg, corrugated extension spouts on drainpipes), require a level of control that is not currently possible within most IMM programs. Environmental control and source reduction efforts begin with a detailed larval survey to determine the key container types that serve as sources for local *Aedes* populations. Notably, removal of conspicuous open containers may "push" *Ae. albopictus* females to oviposit in cryptic habitats; hence, it is critical to locate and assess all potential container sources, including those that may be more difficult to identify, access, and treat with larvicides.[35,60]

Table 3. *Aedes* Larval Environments

- Tires, new and used
- Open water storage tanks
- Bottle caps
- Buckets
- Birdbaths
- Coolers
- Fountains
- Gutters and drains with standing water
- Garbage bins and cans
- Houseplant containers and trivets
- Roadside ditches
- Scrap yards with pools in junk
- Fast-food containers and cups
- Cemetery urns
- Unmaintained swimming pools
- Pet bowls
- Septic ditches
- Lawn swales
- Street catch basins
- Depressions in tarp covers
- Rainwater corrugated extension spouts
- Broken appliances
- Vegetation (phytotelmata)
    - Tree holes/crotches
    - Leaf axils
    - Bromeliads

BIOLOGIC CONTROL

Summary

- Larger aquatic predators such as *Gambusia* spp may control mosquito larvae to some extent in permanent or semipermanent bodies of water but will not control adult mosquitoes fully
- Smaller aquatic predators (eg, predacious copepods) may control mosquito larvae that develop in containers; however, source reduction is the optimal control strategy for these species of mosquitoes
- Proper agencies must be consulted and the potential environmental impact must be assessed before any biologic control agent is released
- Bats, birds, and dragonfly nymphs are not effective as the major component of a mosquito control program

Biologic control is defined as using biologic organisms or their by-products to manage vectors, including mosquitoes.[8] It also includes using genetically modified organisms. Mosquitocidal bacteria are discussed in this document separately.

The most readily available large predator for biologic control is *Gambusia* spp (mosquitofish). These small fish are native to eastern North America and are considered an invasive species elsewhere. Typically, *Gambusia* spp are most effective in permanent habitats where *Culex* and *Anopheles* are the primary species and where mosquito densities are not high and vegetation is relatively sparse.[8] Their efficacy in controlling mosquito populations varies widely from excellent to none.[8] *Gambusia* spp do poorly in colder climates and may negatively impact native species.[64]

Biologic control of container-inhabiting mosquitoes is problematic. These sources of water are cryptic and ephemeral, making it not only difficult to identify sources, but also to introduce and sustain biologic control agents. For these mosquitoes, it is generally more effective to simply remove sources from the environment. Smaller predators (eg, *Mesocyclops longisetus* [predacious copepods]) have been used with some success.[65]

Bats,[66] birds,[67] and dragonfly nymphs have been suggested as voracious predators of mosquitoes; however, evidence suggests that this is not true. They are not selective predators of mosquitoes and are not effective as a major component of any control strategy.

CHEMICAL CONTROL OF LARVAL AND ADULT MOSQUITOES

Summary

- Larval management
  - Choices of larvicides and pupicides are based on the individual needs of mosquito control districts
  - Factors to consider when choosing appropriate agents include efficacy, costs, and regulatory and environmental constraints
  - If practical, direct application of larvicides and pupicides should be considered as part of a comprehensive program to control container-inhabiting mosquitoes
  - Low-volume larvicides should be applied using appropriate equipment and effective droplet sizes (see summary, below). Conventional ultra-low volume (ULV) equipment is generally not appropriate for these applications
  - Hot-spot treatments reduce the time and effort needed for door-to-door campaigns in large areas; combined with use of larval surveillance techniques, aerial photography, and geographic information system modeling, these approaches have been demonstrated to be highly effective
- Adult management
  - Adulticiding should be used when deemed necessary, according to data gathered in surveillance activities or in response to public health needs
  - Efforts must be made to focus adulticide applications within intended target areas
  - ULV space sprays are the only effective means of rapidly reducing transmission risk during arboviral disease outbreaks
  - ULV applications are effective in reducing populations of adult container-inhabiting *Aedes* in peridomestic environments, even when applied at night
  - Barrier and residual sprays can provide long-lasting control of adult mosquito populations
  - Removal trapping may be effective but highly cost- and labor-intensive and should be reserved for use during serious outbreaks of mosquito-borne disease
  - Lethal ovitraps are an effective and inexpensive method for controlling container-inhabiting mosquitoes

Larval Management

Direct Application of Larvicides

Direct applications of insecticides may be performed by hand or using motorized equipment. Choices of larvicides and pupicides should be based on the individual needs of mosquito control districts, with particular attention paid to regulatory and environmental constraints, cost, and efficacy. Larvicides may be divided into biopesticides and chemical products.[35]

Biopesticide larvicides include

- Microbial control agents such as *Bacillus thuringiensis* (Berliner) serovariety *israelensis* de Barjac (*Bti*), *B. sphaericus* Meyer and Neide (*Bsph*) (*Lysinibacillus sphaericus*), and spinosads derived from fermentation from the soil actinomycete *Saccharopolyspora spinosa* Mertz and Yao
- Insect growth regulators such as methoprene and pyriproxyfen
- Chitin synthesis inhibitors such as diflubenzuron and novaluron

Chemical larvicides include the organophosphates and oils or monomolecular films, which spread on the water surface to form a thin film that prevents gas exchange and leads to eventual suffocation of mosquito larvae.[35]

Larvicides are available in a variety of formulations, including solid granules of various shapes and sizes, water-dispersible granules applied unaltered or in mixture, slow-release briquettes, water-soluble pouches, or pure liquid formulations.[35] Selection of formulation should be driven by careful consideration of the target environment.

For container-inhabiting *Aedes*, given the large number of potential larval sites and the fact that many of these containers are located on private property, direct application may have only limited success and is labor-intensive and time-consuming, while requiring public education efforts (addressed separately in this document) and close cooperation with the community.[35] However, if practical, direct application should be incorporated into an overall IMM approach, because many of the products available are effective and may have a long-lasting residual effect. Because the larval habitats of these species are containers that tend to hold small volumes of water with little to no outflow, most insecticides that infiltrate those habitats exhibit maximum toxicity and persist for a longer period than if they were applied to open water habitats.[35]

Area-Wide Low-Volume Application of Larvicides

Area-wide low-volume (LV) larviciding is effective in delivering insecticides to broad areas, including container habitats that may be inaccessible for direct application efforts.[35] Similar to aerosol ULV adulticiding, where the dispensed small droplets rely on light winds to aid in the spread of droplets, LV larviciding relies on weather conditions for delivery. The major difference between the 2 approaches is droplet size: for ULV adulticiding, a droplet size range of 5 to 25 µm is most efficient, because this size is most likely to stay aloft and deliver a toxic dose to the adult mosquito on contact.[68,69] A larger droplet size (100 to 300 µm) is required for LV applications to create a droplet that is light enough to stay aloft temporarily, but heavy enough to settle into containers harboring *Aedes.*[70] This approach allows for hundreds of residential parcels to be treated in a single nightly application.[60]

Area-wide LV application of larvicides usually uses liquid or emulsified larvicide formulations of *Bti*, such as VectoBac® 12AS or VectoBac® WDG (Valent BioSciences Corp, Libertyville, IL) because of affordability, superior efficacy, reduced nontarget impact, favorable environmental profile, lack of insecticide resistance, and ease of operational use.[60] VectoBac 12AS has a much lower cost per acre than that of VectoBac WDG; however, it can cause spotting on automotive paint and is unsuitable for use in residential areas. VectoBac WDG is more potent at lower concentrations than VectoBac 12AS and is routinely being used by mosquito control programs to target container-inhabiting mosquitoes.

Conventional ULV equipment commonly used in mosquito and vector control programs has insufficient flow rates to apply *Bti*.[70] The Ag-Mister LV-8™ orchard sprayer with 8 nozzles (Curtis Dyna-Fog, Westfield, IN) and the Buffalo Turbine CSM2 Mist Sprayer (Buffalo Turbine, Springville, NY) can deliver increased flow rates and appropriate droplet sizes for peridomestic applications of *Bti*.[70] Aerial equipment also has been used to apply *Bti* in areas where *Aedes* are present and where risks of arboviruses are high.[35]

Beyond the biopesticides, insect growth regulators (IGRs) such as methoprene and pyriproxyfen have been used for area-wide LV applications.[70] Two liquid formulations of methoprene, Altosid® Liquid SR-5 and Altosid® Liquid SR-20 (Wellmark International, Central Life Sciences, Schaumberg, IL), and one formulation of pyriproxyfen, NyGuard® IGR concentrate (McLaughlin Gormley King Co, Minneapolis, MN), have been evaluated in suburban habitats.[60,71] Because lower application rates and flow rates are needed for these formulations, conventional ULV sprayers may be used for area-wide campaigns. The cost per acre for IGRs is generally lower than the cost of *Bti*; however, conducting bioassays is more difficult and time-consuming because of the delayed effects of IGRs and the need for prolonged monitoring to document inhibition of emergence to confirm the effectiveness of applications.

Hot-spot Treatments

Hot-spot treatments rely on ground larval surveillance, aerial photography or imagery, GIS modeling, and adult mosquito or ovitrap surveillance data to pinpoint hot spots within target communities.[71] Such an approach may be particularly useful for container-inhabiting mosquitoes because a small number of sites (such as junkyards, tire recycling sites, some residential sites) may be responsible for the majority of mosquito production in a given area.[35,72]

In the urban habitats of central New Jersey, Unlu and colleagues used a hot-spot approach for *Ae. albopictus* suppression that leveraged data from adult surveillance traps to determine focal locations of infestation (see case study earlier in this document).[73] This approach reduced the use of chemicals and the amount of time spent on source reduction while effectively reducing adult mosquito populations. Notably, targeting hot spots achieved early-season (June to July), area-wide control.

Hot-spot treatments reduce the time and effort needed for door-to-door campaigns in large areas and help ease the pressure on mosquito control inspectors. Furthermore, during public health emergencies in response to arboviral disease cases, areas with human cases can be managed quickly and appropriately. Thus, this approach may be used as an effective tool in an IMM program.

Case Study

Using a Hot-spot Approach to Manage *Aedes albopictus*

Unlu and colleagues (2015) employed a hot-spot approach to controlling *Ae. albopictus* in a suburban environment.[73]

Surveillance was conducted using BGS traps. Trapping locations were selected by overlaying a 175-meter grid over the study sites. These distances were based on the available resources within the county and on knowledge of *Ae. albopictus* flight range. Within the intervention site, 175-meter fishnets resulted in 16 traps. The authors also sampled the control site to compare *Ae. albopictus* populations within the study site. Grids resulted in 24 BGS traps in the control site. Trapping locations were selected by asking permission from residents located near the center of each fishnet grid.

Sampling was performed once a week for 24 hours using BGS traps that were deployed in the shaded areas of backyards (near vegetation) for each parcel selected. The same trapping location was used every week. A trapping site was identified as a hot spot when 5 or more *Ae. albopictus* (ie, intervention threshold) males or females were collected in that one trapping site. After a trapping site was identified as a hot spot, ArcGIS Desktop 9.2 was used to create a 150-meter buffer around that location with three 50-meter increments.

Field crews with maps initiated inspections of selected parcels within the first 50-meter buffer, including front and backyards. After obtaining permission from each owner, control efforts were carried out in as many parcels as possible within each buffer. Field crews were deployed to different parcels to conduct a thorough inspection. Field crews inspected the front and backyards of each parcel, surveying everything that could potentially hold water and produce mosquitoes, such as plant pot saucers, tires, buckets, fence posts, and corrugated extension gutters. After parcels were thoroughly inspected, the alleys were also inspected. During inspections, different control methods (per case) were used, based on the nature of the mosquito infestation. Tires were the only containers removed with the resident's permission. The remaining containers, both with and without water, were treated with a combination of 2 larvicides and a pupicide based on container type. In addition, overgrown vegetation was managed in abandoned parcels to eliminate mosquito resting areas and detect additional containers hidden under the brush. Barrier spraying was conducted when overgrown vegetation in alleys and abandoned parcels made brush removal unfeasible.

Adult Control

Adulticides are applied to impinge upon the mosquito target in flight or at rest.[35] Adulticiding based on surveillance data is an extremely important part of any IMM program and may form the primary treatment method for many programs where comprehensive larviciding is not practical. Efforts must be made to limit exposure and deposition to target areas.

Adulticides utilized in basic programs are typically applied as a ULV spray, whereby small amounts of insecticide are dispersed by aircraft or truck-mounted equipment. In some jurisdictions, adulticides may also be applied via thermal fogs, utilizing heat to atomize droplets. Adult mosquitoes may also be targeted by barrier treatments, which involve application of a residual insecticide to vegetation or structures where mosquitoes are known to rest. Additional mechanisms, such as removal trapping and lethal ovitraps, are also available.

Handheld and Area-Wide ULV Adulticides

Space sprays use ULV technology (cold fogging or thermal space sprays) and are applied with specialized spray equipment mounted in aircraft, on the back of trucks, or by hand.[8] Released aerosols drift through the target zone, persisting in the air and making contact with flying mosquitoes. Space sprays are short-lived and have negligible residual effects. These modalities remain the only effective means of reducing transmission risk during arboviral disease epidemics. Handheld applications of these agents have the same limitations as door-to-door applications of larvicides; however, this modality may have utility for treating limited areas associated with index disease cases.

The primary aim of area-wide ULV adulticide applications is to deliver an effective droplet size using the least amount of insecticide that will control target mosquitoes.[35] Droplet sizes ranging from 5 to 25 µm are most efficient. Weather conditions must be considered when planning and delivering applications; most often, adulticide applications are conducted in the evening or early morning, when a thermal inversion has occurred to keep the insecticide from dispersing upward and in light winds to aid in carrying droplets.

ULV applications are often believed to be ineffective in controlling diurnally active urban mosquitoes, such as *Ae. aegypti* and *Ae. albopictus,* potentially as a result of structural obstacles that protect gravid or engorged females resting during nighttime ULV applications.[74] However, some evidence suggests that such applications may indeed be effective in reducing adult mosquito populations.[75] There is growing evidence that container-inhabiting *Aedes* in peridomestic environments may be active even at night and that ULV applications within urban and suburban habitats may penetrate into habitats that were previously believed to be inaccessible.[76] Advances in formulations and technology are driving changes in adulticide

applications, leading to use of the minimum effective dose for maximum efficacy, precision, and accountability. Furthermore, nighttime ULV adulticiding is proving effective in reducing invasive *Aedes* abundance, and its potential for use as part of IMM programs and during disease epidemics, when reducing human illness is of paramount importance, should be highlighted.

Barrier and Residual Adulticides

Residual spraying is used when a longer-term effect is required. Mosquitoes must land on a surface deposit of the insecticide to absorb a toxic dose. Residual sprays often are referred to as barrier or surface treatments. Because the treated areas are generally small, handheld devices, such as a backpack mist blower or compression sprayer, are employed. The insecticide is applied at a concentration lethal enough so that a mosquito landing on the treated vegetation will absorb a sufficient amount of the active ingredient to cause mortality. Barrier treatments can provide control for days or even weeks, depending on the insecticide formulation. These applications are primarily conducted with synthetic pyrethroids and applied to vegetation, unmovable large containers, external walls of homes and sheds, and fences in residential backyards. Although this method of application may be effective against the targeted species, it remains subject to the labor and time issues associated with any door-to-door application scheme.[74]

Studies suggest that barrier spraying of residual insecticides is effective in reducing biting populations of *Aedes*.[77,78] Indoor residual spraying may not be as effective against exophilic species, such as *Ae. albopictus*; therefore, barrier or residual applications against *Ae. albopictus* should concentrate on focal areas that support large larval populations or selected resting sites for peridomestic adult mosquitoes.

Removal Trapping

Questions remain whether traps such as the BGS and Mosquito Magnet can be used for the management of invasive mosquito species. Mixed results have been obtained with the use of the Mosquito Magnet trap to manage *Aedes* species.[79,80] Traps have been used with success to reduce biting pressure locally from the western treehole mosquito, *Ae. sierrensis* (Ludlow). This species primarily undergoes 1 or 2 generations per season and does not fly far from its larval developmental sites, so removing biting adult mosquitoes through trapping is a viable control option.[79] Similarly, *Ae. aegypti* and *Ae. albopictus* do not fly far from larval developmental sites. Use of BGS traps baited with the BG-Lure has been shown to reduce population abundance[81] and human biting rates compared with no intervention.[82] Recent studies in the United States utilizing Mosquito Magnets, coupled with human-scented and octenol lures, have shown that these traps may outperform BGS traps for capturing *Ae. albopictus* up to 6-fold.[83] Cost and labor are a major issue in using BGS traps for control, because trap density and maintenance requirements are high.

Lethal Ovitraps

Ovitraps are simple, inexpensive devices consisting of a small cup that holds water, often mixed with an ovilure, and provide a substrate on which gravid mosquitoes may lay their eggs.[35] Ovitraps have particular utility for *Aedes* because of their predilection to oviposit in artificial containers. As outlined above, these devices have been used extensively for conducting surveillance for invasive *Ae. aegypti* and *Ae. albopictus*.

Lethal (autocidal) ovitraps, such as the CDC-AGO, combine oviposition stimulants with insecticides or mechanical means of ensuring that the trap does not produce adult mosquitoes. These traps have consistently been shown to be effective in reducing populations of container-inhabiting mosquitoes.[34,84-88] Sustained and effective reductions of *Ae. aegypti* populations (80%) have been achieved by the use of CDC-AGO traps (3 per home) in more than 85% of houses in neighborhoods in southern Puerto Rico.[34]

MONITORING FOR EFFICACY AND RESISTANCE

Summary

- To ensure temporal and regional uniformity and to assist in the ability to compare results and assess trends, the American Mosquito Control Association recommends following the procedures for pesticide resistance testing outlined by the US Centers for Disease Control and Prevention
- Annual resistance testing should be a routine component of all integrated mosquito management programs and occur prior to the start of each mosquito season
- Resistance testing should be conducted before a product is first used
- Resistance testing should follow published protocols to provide standardized results
- A quick resistance assessment should be conducted prior to emergency adulticiding
- Assay results should be reported to MosquitoNET: https://wwwn.cdc.gov/Arbonet/MosquitoNET/

Resistance to insecticides is a potential threat to all mosquito control programs. IMM places a priority on mitigating insecticide resistance by using insecticides rationally, monitoring pesticide resistance routinely, and managing insecticide-resistant populations through better coordination among mosquito control programs, insecticide manufacturers, state agencies, and other stakeholders.

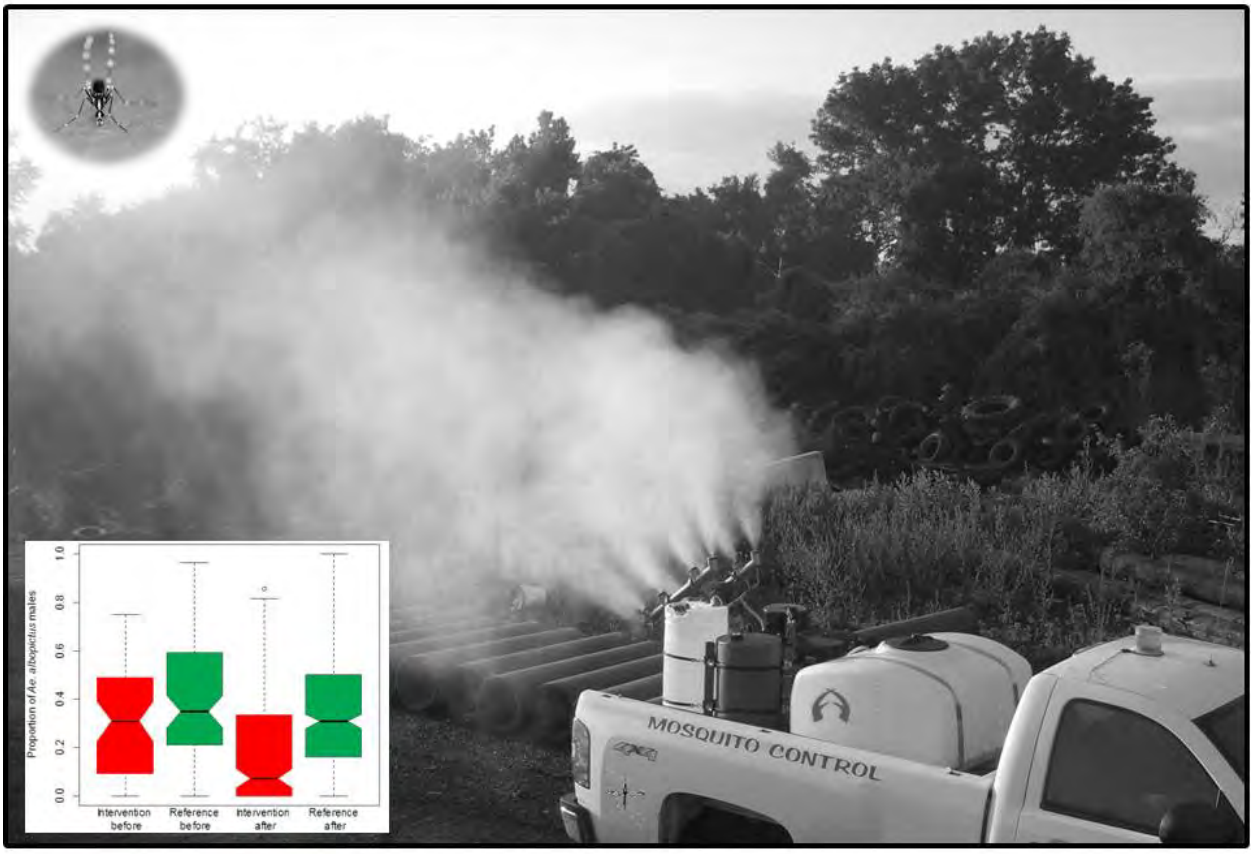
The problem of insecticide resistance among mosquitoes is exemplified by worldwide data gathered during the World Health Organization's effort to control malaria.[89] After many decades of intensive effort, all major vectors of malaria show at least some resistance to all 4 recommended classes of insecticides. Since 2010, 60 countries have reported resistance to at least 1 class of insecticide, with 49 countries reporting resistance to 2 or more classes. However, this is likely an underestimate of the true prevalence of resistance, since many countries do not routinely monitor insecticide resistance locally. Further, the data are frequently not reported in a timely manner, or—in some cases—at all.

Insecticide resistance is broadly categorized into 2 groups: metabolic and target-site.[90] The former occurs when resistant mosquitoes develop enzymes that more rapidly detoxify pesticides, preventing the active ingredient from reaching its physiologic target. The latter is observed when the target of the pesticide on the mosquito is altered by a mutation. For example, mutations of sodium channel receptors produce resistance to pyrethroids, and resistance to organophosphates and pyrethroids results from mutations of the neurotransmitter acetylcholinesterase.

Cross-resistance (ie, resistance to pesticides that share the same mode of action) is common and further restricts the choice of pesticides that can be used.

Behavioral resistance may also occur.[8] For example, when resting surfaces are treated with pesticide, some mosquitoes in the target population may never land on them. This difference in exposure alters survival rates of the next mosquito generation and may increase the frequency of any genetic factors that contribute to the avoidance behavior. If this is true, over time, progressively fewer mosquitoes will be killed by the pesticide.

Detailed recommendations for surveillance and evaluation of pesticide resistance in *Ae. aegypti* and *Ae. albopictus* were released in 2016 by the CDC.[91] A comprehensive discussion of the CDC bottle bioassay can be found online at the link in the reference cited here.[5] To ensure standardized data, the AMCA recommends following the procedures outlined by the CDC.



COMMUNITY OUTREACH

Summary

General Guidelines and Objectives[1]

- **Educational resources are available from the US Centers for Disease Control and Prevention and other national organizations that can be leveraged locally (for example, visit https://www.cdc.gov/zika/comm-resources/toolkits.html)**
    - These materials should be customized or accompanied by materials that describe your local situation
- Education is a continuous process that ideally begins before there is a credible public health threat
- Establish and maintain credibility and public trust by providing timely, accurate, and actionable information about what is known and what is not known
- Include adequate information to dispel rumors and misinformation
- Increase access and knowledge of accurate information about arboviral diseases among populations and community members at risk. Convey appropriate action messages for each audience
- Increase knowledge of and support for vector control activities in communities
- Increase the capacity of health care providers to share accurate health information about arboviral disease prevention to at-risk populations (eg, pregnant women and women of reproductive age, their partners, and affected populations with regard to Zika virus)
- Motivate action by community leaders and organizations to protect at-risk populations from arboviral diseases (for example, protection of pregnant women from Zika infection)
- Route public messages through the agency Public Information Officer for a consistent message

Planning an Outreach Program

- When planning an outreach program, priorities, resources, and budget should be considered:
    - What is going to make someone care about mosquito control? What is your message?
    - Have you determined who your stakeholders are (or should be)?
    - Do you know the best ways to reach and serve your stakeholders?
    - What are the motivating factors for each stakeholder to become engaged?
    - Have you identified any gaps in your message, current outreach, or use of your programs/services?
- Summarize messages with easy-to-remember phrases (ie, "The *5 P's* of Prevention")

Consider Your Stakeholders

- Stakeholders include persons, groups, or institutions that can affect or be affected by a course of action
    - Stakeholders include community residents, agencies (health departments), local and regional officials, local fire and police departments, leaders of community organizations, and the media, among others
    - Involving other stakeholders in your outreach helps to develop support for the plan and identify barriers to implementation
    - Mitigation planning should also incorporate information from scientific and technical sources and subject matter experts

Consider Communication

- People: Stakeholders represent different groups, in terms of culture, language, race, values, education, or economics
    - Gender, age, and socioeconomic status may be risk factors for arboviral disease transmission
- Channels: Obvious channels for outreach are schools, clubs, churches, and other organizations. Also consider the following:
    - Municipal departments (such as public works, sanitation, trash removal, and building inspection)
    - "Green" organizations (focused on healthy environment and self-reliance)
    - Youth organizations (such as Girl Scouts and Boy Scouts)
    - Social organizations (such as Habitat for Humanity)
    - Intern programs (social workers, medical personnel, biologists, etc)
    - Public health organizations (community health clinics, medical reserve corps)
    - Extension programs
    - Citizen scientists
- Live Events: Consider where a presence may be beneficial
    - Ensure a translator is on-site, if needed
    - Memorialize the event, self-promote, and spread the message after the event via recordings or pictures posted to social media; recordings of such events may be leveraged as part of public service announcements (PSAs)
- Social Media
    - Creating user-engaging content through various websites, blogs, and social media outlets to maximize reach at low cost
    - Involve social influencers: Bloggers, newspapers, and local radio/TV stations that can do periodic stories or provide 30-second reminders and PSAs

- Research organizations or media outlets are already in existence and have an established following. Build link relationships with those sites so that your website can be easily accessed by a simple click

Formulating a Work Plan

- Outreach is an ongoing process. The link below is an example of how to create a holistic work plan for your community outreach so that measurements can be effectively gathered

Enroll America Outreach Work Plan:
https://s3.amazonaws.com/assets.enrollamerica.org/wp-content/uploads/2013/12/Enroll-America-Factsheet-HowToOutreachWorkPlan.pdf

Guidelines for Effective Outreach

Accurate, clear, and timely information is required to reduce public anxiety and give people practical and concrete steps to protect themselves. Getting the word out in a nonstigmatizing manner (educating, not frightening) is critical.

- Meet people where they are
- Be respectful
- Listen to your community
- Build trust and relationships
- Get the word out in a nonstigmatizing manner
- Offer service and information in a variety of locations (including home visits) and at nontraditional times, especially after work hours or on weekends
- Make written information friendly and easy to understand, at an accessible reading level and organized such that important information is summarized at the top of each page
- Provide information in the primary language of those who will use the service
- Adequate follow-up is critical
    - Evaluate effect of the intervention and targeted messaging
    - Continually assess whether activities are meeting objectives

Public education is a critical component of any mosquito control program. Such programs may include methods that the public can use to reduce larval habitats on private properties and the use of personal protection measures (repellents, clothing, or behavior modifications) to prevent mosquito bites.

Public education and participation are particularly important in light of the problem posed by container-inhabiting mosquitoes because *Ae. aegypti* and *Ae. albopictus* thrive in the peridomestic environment, and their prevalence is closely associated with artificial containers. Such containers are problematic not only because of access issues and quantity, but because even when removed, the mosquitoes may return to the same habitat. Eliminating or reducing artificial container habitats clearly requires public engagement and appropriate education. For these reasons, public education campaigns may be substantially effective as part of an IMM program if community participation and "ownership" can be achieved. Such programs may be passive or active.

Passive education (distribution of educational materials) is not highly effective in engaging the public in control efforts.[92] In one study, 6 communities were randomly selected to receive 1 of 3 strategies: 1) both education and mosquito control 2) education only 3) no education or mosquito control. The education program included a 5-day elementary school curriculum in the spring and 3 door-to-door distributions of educational brochures. The number of mosquito-larval container habitats were counted in 50 randomly selected homes per study area before and after each educational event. Although there were reductions in container habitats in sites receiving education, they were not significantly different from the control. These results suggest that conventional passive public education is not sufficient to motivate residents to reduce backyard mosquito-larval habitats.

Utilize Existing Resources to Maximize Outreach While Minimizing Cost

The CDC has made available a broad range of tailored communication materials to use in readiness for local transmission of arboviral diseases. Many of these materials focus on Zika virus as the arboviral disease of greatest current concern; however, most are applicable in a broad range of situations. A selected list of useful materials can be found below; all are available in PDF format for easy printing and distribution (https://www.cdc.gov/zika/comm-resources/toolkits.html). Many of these materials are available in multiple languages.

• Zika: The Basics of the Virus and How to Protect Against It • Keep Mosquitos Out of Your Septic Tank • Protect Yourself From Mosquito Bites • Help Control Mosquitos that Spread Dengue, Chikungunya, and Zika Viruses • Build Your Own Prevention Kit for Pregnant Women	• Protect Your Family and Community: How Zika Spreads • What you Need to Know About Indoor/Outdoor Spraying • What you Need to Know About Using Adulticides • Accordion-style Insect Repellent Wallet Card • Mosquito Prevention Door Hangers • Zika Basics Flipbook for Community Healthworkers

Active education campaigns have provided better results but are more resource intensive. A more recent study in New Jersey targeting urban and suburban habitats found that using an active community organization (AmeriCorps) for public health education, container removal, tire recycling, gutter cleaning and appropriate drainage, trash can drilling, rain barrel covering, or container elimination demonstrations, and other assistance was much more successful than previously utilized passive means in the same habitats.[93] These results suggest that, although passive education materials may be appropriate for a small proportion of community members, active education campaigns are much more effective on a large community-wide scale.

Examples of Effective Community Outreach Programs

Social Media

- Blogs, Twitter, Facebook: Share information with established blogs and other social media. Include links to your, or other relevant, websites
- Competitions: Announce and conduct contests and neighborhood challenges to clean up potential breeding areas, distribute material, etc
- Videos: Begin a “Submit Your Video” campaign to broadcast and recognize specific

activities and efforts of community groups or individuals

Other Communication/Sharing Channels

- Town hall meetings and discussions in community centers and libraries
- PSAs: Share up-to-date information and reminders via newspapers, TV radio, etc
- Localized Blasts: Leverage municipal phone alert systems during high-risk times
- Inserts included in utility bills
- Welcome Wagon Programs: Partner with local Welcome Wagon organizations to add information about property maintenance and responsibility, community resources, etc, to their packages
- Target Tourists: Tourist information centers, airport and cruise terminals, travel clinics

Live Events/Activities

- Learning sessions or health fairs:
    - For private citizens: Invite community members to a learning session that will provide education
    - For third-party communicators: Hold short educational forums with health care providers, school employees, library employees, and other public intermediaries who can help spread your message. Conduct these during lunch and break times, and entice people to attend with free snacks or beverages
- Street fairs or block parties:
    - Use scheduled events such as fairs, parades, picnics, marathons, and sports events to make a public appearance; distribute mosquito repellent (if permitted within local guidelines); encourage people to clean up trash and turn over containers
    - Approach local businesses about participating in the event
    - Interactive displays: Plan visual demonstrations or games to attract and engage citizens
    - Neighborhood clean-up followed by a community party to play games, listen to music, and share food to celebrate the accomplishment (partner with Keep America Beautiful)
    - Train citizen scientists and hobbyists, such as members of garden clubs and naturalists
- Neighborhood calls to action:
    - Work with organizations such as AmeriCorps to go into neighborhoods and drill holes in cans, clean up areas that are potential risks
- Partner with high schools to organize “clean up” days for student credit for volunteerism or community service programs

- "Go Green" synergy: Partner with "Green" organizations to meld your messages and events with their ongoing efforts (clean up trash, tire disposal areas)

The following are possible locations and partners that can provide resources and/or support to the above examples:

- State, municipal, social service agencies and organizations
- Educational institutions, including day care centers
- Health care facilities
- Law enforcement agencies
- Block captains
- Clubs (Kiwanis, Rotary, Senior Center, and 4-H)
- Local businesses
- Churches (provide training to congregations and/or religious leaders)
- Festivals, fairs, community celebrations, and parades
- Social service outreach (career day open house)
- School events (sports events or campus clubs/activities)

RECORD KEEPING

Summary

- Operators/applicators should record the following for each application and maintain records for the time specified by the lead state regulatory agency
    - Applicator's name, address, and pesticide applicator certification number (if applicable)
    - Application date, time of day, and weather conditions
    - Product name and Environmental Protection Agency registration number
    - General location of application and approximate size of area treated (spray tracks, as recorded by an appropriate GPS system, are desirable)
    - Rate of material applied and total amount applied
- Records also must be maintained on the certification and recertification of all personnel involved in pesticide application
- Surveillance reports for disease vector and nuisance mosquito species should be maintained to promote systematic analysis of the effects of interventions; factors that should be recorded include
    - Results from mosquito egg, larval, and adult surveys
    - Records of surveillance locations and mosquito collection data
    - Records of virus testing results
    - Results of resistance monitoring of local mosquito populations
- Where possible, integrated mosquito control management systems should also include provisions for
    - Logging/tracking citizen complaints and service requests
    - Maintaining records of nonchemical interventions, including community education, door-to-door outreach efforts, waste tire removals, and container elimination campaigns

Accurate record keeping is essential for a mosquito surveillance and control program. At the local level, surveillance data are used to develop accurate distribution and abundance maps, perform statistical analysis to support the decision to initiate control measures (setting action thresholds), and evaluate the impact of control measures. In addition to state regulatory reporting of insecticide applications and applicator training, the CDC has launched the MosquitoNET online portal to collect monthly data for mosquito presence and abundance, and insecticide resistance testing. Arbovirus detection is also reported to the CDC through a national arboviral surveillance system, ArboNet (https://www.cdc.gov/westnile/resourcepages/survresources.html).

It is important to note the difference between a survey and surveillance program. A survey is a one-time gathering of data, often to detect a species presence or absence, whereas a surveillance program is a continuous process to monitor changes in mosquito populations. Additional locations in the surveillance program will increase the likelihood of detecting the presence of a mosquito species; negative surveillance results also yield important information.[91] As suggested by the CDC, each collection should be assigned a unique identification number. This allows for efficient sample tracking within and between years. The following minimum information should be recorded: life stage targeted, collection method, date, location (city/town and county/ parish, address or GPS coordinates), habitat type, and number and type of mosquitoes collected (genus, species, and—when possible—sex and number). Survey, surveillance, and control data should be collected at the finest possible resolution.

If mosquitoes are tested for the presence of arboviruses, the number tested, assay used, and laboratory result should also be recorded. Additionally, when mosquito populations are collected and tested for the presence of insecticide resistance, the above location information should be collected, as well as number of mosquitoes tested, active ingredient, inhibitor, if used, concentration(s) (µg/bottle), time: (between bottle preparation and testing, diagnostic time, and total test time), percent mortality, and, if applicable, time 100% mortality achieved.

Spreadsheet and database software is readily available for data entry and management and can be performed simply in programs such as Microsoft Excel®. Data can be housed locally or in protected online formats (such as Google Docs), and procedures should be created for entry and backup. Extensive external data management support programs are available but are often expensive and unnecessary for most mosquito control programs.

Finally, and perhaps most importantly, pesticide application information should be documented and records maintained as required. The Clean Water Act (1972) regulates point source pollution to or near the waters of the United States, and the National Pollution Discharge Elimination System (NPDES) permit allows for discharges resulting from pesticide applications. Until recently, the mosquito control applications were exempt, since pesticides are regulated by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Mosquito control entities must now apply for an NPDES General Use Permit or through authorized states. Applications must also still comply with all state pesticide regulations, statutes, and FIFRA labeling. Pesticide application records should contain applicator's name, address, and pesticide applicator certification number (if applicable), date of application, product applied name and EPA registration number, rate of material applied, total amount applied, location of application, and approximate size of area treated. Documenting time of day, weather conditions, and spray tracks or blocks, as recorded by an appropriate GPS system, is desirable.

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Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 9:18 pm
Browser:	Firefox 88.0 / OS X
IP Address:	66.31.40.237
Unique ID:	803972563
Location:	

Name	Amy Meltzer
Subject:	mosquito spraying
Comments:	Please stop spraying for mosquitos. Many insects species are at risk of going extinct, This is happening at an alarming rate that will ultimately threaten our ability to pollinate crops. There are other ways to control mosquitoes that do not involve poisoning other insects and the birds that eat them. We just need some public education about alternative methods of mosquito control and we can avoid indiscriminately poisoning our ecosystem.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 9:39 pm
Browser:	Chrome Mobile 90.0.4430.91 / Android
IP Address:	72.224.249.182
Unique ID:	803978901
Location:	

Name	Tracey Thibaudeau
Subject:	Larvacide
Comments:	Use of BT for mosquito control is safe, natural and should be widely encouraged for all public to use at opposed to fogging by cities, towns and homeowners. Wide scale pesticide use should not be an option at it has too many short and long term effects on non targeted invertebrates.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 11:18 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	216.193.174.174
Unique ID:	804299473
Location:	

Name	Edward Stockman
Organization / Affiliation:	Plainfield Agricultural Commission
Subject:	Mosquito spraying

Comments:

It is difficult for the members of the Plainfield Agricultural Commission to understand why adulticides for mosquito control would be sprayed in Plainfield. At our elevation, Plainfield is located on the eastern side of the Berkshire Hills with an average elevation of 1800 feet, we do not have habitat conducive to mosquito breeding. Due to Plainfield's elevation most of our water resources are headwater and moving. We have very few ponded or stagnant wetlands to breed mosquitoes and those we do have are presently healthy ecosystems with dynamic aquatic food chains that control most mosquitoes.

Research indicates adulticides are the least effective method of mosquito control. It's a mystery why the entire state should be sprayed with the least effective control methodology. It's no mystery that personal protection methods are most effective. People who live in rural areas know this but perhaps an education effort by state agencies for urban and suburban communities would be more effective in stopping mosquito-borne diseases. Plainfield has several organic and conventional farms. It is impossible for spray operations to not contaminate these farms. At 1800 feet in elevation, Plainfield always has windy conditions making land-based spray operations less effective and contaminating. Of course, aerial spraying could never exclude farms. To think otherwise is to not understand the nature of chemical drift. All farms in Plainfield should be opted-out from all spraying methods by default

.

Recent studies indicate mosquito control pesticides are toxic to a broad range of non-target fish, bird, amphibian, and insect species, including species that are themselves mosquito predators. To try and control mosquitoes while sacrificing pollinators is counterproductive. The importance of pollinators in all agricultural systems is paramount. Pollinator populations need to be protected at all costs.

Recent articles in the Boston Globe revealed that mosquito control pesticides already sprayed in some Mass communities contained toxic, forever chemicals called PFAS. These chemicals are highly mobile in water and bioaccumulative in living organisms. Will the proposed mosquito control sprays contain these chemicals or other harmful substances? After reading the Globe articles it's apparent that no one knows.

Wholesale mosquito control spraying of the entire state is the least effective method of control and should not be implemented in Plainfield.

Respectfully submitted on behalf of the Plainfield Agricultural Commission,
Edward Stockman, Member

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 15, 2021 11:59 am
Browser:	Safari 14.0.3 / OS X
IP Address:	73.137.247.88
Unique ID:	793035541

Name	Rosmarie Kelly
Subject:	need for someone who understands mosquito control
Comments:	I worked at the East Middlesex Mosquito Control Program as the entomologist from 1994-1999. I currently work as an entomologist at the Georgia Department of Public Health and am on the Georgia Mosquito Control Association Board. Mosquito control in Massachusetts follows Integrated Mosquito Management best practices. They provide education. They do more than sufficient surveillance to justify any actions they take regarding control. They work under the EPA NPDES permit, which adds double oversight to FIFRA. I did the job myself for 5 years, so I do know what I am talking about. What mosquito control in MA needs is someone on the task force and on their governing board to actually understand mosquito control. In MA, people working in mosquito control at the municipal level are licensed. They take classes to fulfill the CEU requirements. Mosquito control, esp as done in MA, reduces disease. The EEE outbreak would have been far worse without mosquito control. Look what happened when WNV entered New York in 1999 where they had no surveillance or control. Now we have WNV all over the US, causing illness, long-term health issues, and death. You should be proud of the job they are doing, and if you had any understanding of that job, you would be. In GA, we have only a few programs that are run as well as the programs in MA are run. Most of our programs are spray and pray programs run through the Departments of Public Works. Part of what I do in my position is to try to educate people in those programs. We have no mandate for municipal applicators to have pesticide licenses. MA is ahead of us on that as well. MA is fortunate in the quality of the mosquito control programs. When people tell me mosquito control is of no use, I tell them to go visit Savannah, GA. Savannah has a huge tourist industry. They would also have a huge salt marsh mosquito problem, and very little tourism, without their well-run integrated mosquito management program. I then tell people to visit Darien, GA. Darien is right down the coast a bit from Savannah. They have an old fort there, but very little tourism. They have no mosquito control. They have huge swarms of salt marsh mosquitoes. i Have done surveillance there. I had 1000s of mosquitoes in my traps. I put repellent on every time I got out of my car to pick up a trap. That is what well-run mosquito control does, it means you don't have to think about the mosquito problem, because there isn't any. MA has well run mosquito programs.
File	https://massgov.formstack.com/admin/download/file/10408132268

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 30, 2021 11:10 am
Browser:	Firefox 87.0 / OS X
IP Address:	75.69.117.225
Unique ID:	802031467
Location:	

Name	Rebecca Jones
Subject:	the Mosquito Control for the 21st Century Task Force
Comments:	Dear Senator Comerford, I am a resident of Whately, a physician, Whately Board of Health member, and a climate activist. Thank you for this opportunity to voice my support for the Mosquito Control for the 21st Century Task Force. I greatly appreciate your work to come up with a better and more thought out plan to protect from arbovirus than simply relying on aerial spraying. Aerial spraying seems to me a reactive gesture, meant to reassure the public but in fact risking the health of humans and wildlife. I worry about the effects of these untargeted toxins: their impact on vulnerable species including dragonflies and damsel flies that prey on mosquitos; the resistance they can induce in mosquitos; the "forever toxin" PFAS that has been found in Anvil 10 & 10. Arbovirus is a rare but serious health risk that will increase with a warming planet. It is critical we not be seduced by performative reactions that make us feel like we are doing "something"; and instead use science and thoughtful pace to come up with real solutions that incorporate a broad understanding of health, climate change, and habitat protection.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 8:07 am
Browser:	Firefox 88.0 / OS X
IP Address:	73.234.243.15
Unique ID:	804128296
Location:	

Name	Andrea Bugbee
Subject:	Broad pesticide application is dangerous AND avoidable
Comments:	Hello! Thank you for taking on this work. My hope is that you please, please examine and employ natural and proactive mosquito control measures. Broad spraying of pesticides the entire ecosystem - including us!!! From microorganisms right on up the food chain, insects, especially pollinators, are crucial to our long term survival. Please study other towns across the nation that have addressed mosquito control through environmentally responsible measures. Massachusetts has the opportunity to join these leaders and set an example for other states. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 30, 2021 9:04 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	75.69.46.3
Unique ID:	802310478
Location:	

Name	Ian Lippincott
Organization / Affiliation:	Stainsworth Ink.
Subject:	disclosure of chemicals used
Comments:	for those of us with farms, animals, small children, colonies of dedicated pollinators, or concerns about the long-term effects of the chemicals used in large-scale mosquito treatment, where does the task force explain what is in its cocktail of poisons? Where is the publicly-accessible data on these chemicals and has UMASS released any studies on the use of them? In times of extreme climate change, habitat destruction, and native species extinction, what is the Mosquito Control Task Force doing to protect other, beneficial, insects and pollinators while spraying for mosquitoes? No one likes mosquitoes, EEE, or West Nile, but we are already at a dangerous decline of our birds and pollinators due to pesticides and herbicides. FULL DISCLOSURE of the species these chemicals affect (in addition to mosquitoes) and its effects on the surrounding species and habitat, as well as how far the broadcast will reach (ie: is there a map that property owners and farmers can see in advance of deployment?). The local communities and habitat conservationists have a right to the transparency of this process and an ability to opt-out. Thank you, -Ian Lippincott

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 2:10 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	174.192.15.184
Unique ID:	804422409
Location:	

Name	Kirsten Miller
Subject:	Mosquito Control Task Force
Comments:	I strongly believe that mosquito spraying is a public health issue and should be handled at the town or city level. It should not be managed by a road district in Sherwood Greens, Becket, MA, where there is a board comprised of volunteer, mostly second home owners. I live in Sherwood Greens as a full time resident where spraying has been allowed to take place despite the fact that the town of Becket has opted out. I am very concerned for the health of my friends and family. Now there is possible contamination of PFA's in the environment because of the canisters the mosquito spray was stored in. Sherwood Greens does not have the expertise nor the organization to manage the spray appropriately and should not be making health-related decisions for myself or my family now or in the future.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 1:24 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	73.248.200.246
Unique ID:	804395236
Location:	

Name	Jennifer Gruener
Organization / Affiliation:	Warren County Mosquito Extermination Commission
Subject:	Modern day mosquito control is based on solid science

Comments:

I thank you for the opportunity to take my comments. I live and work in New Jersey; however, I have worked with many of the mosquito control professionals from Massachusetts and have had the pleasure of attending several of their professional meetings, trainings, and conferences. First, I would like to say that Massachusetts has a very dedicated and well-educated work force of mosquito control professionals. They are respected nationally. Massachusetts mosquito control, like New Jersey, uses an Integrated Pest Management (IPM) approach to mosquito control utilizing many different strategies to keep mosquito control populations at tolerable levels and below levels mosquito borne disease concerns.

I was able to listen to a portion of the recent Listening Session and was concerned about the amount of misinformation given to the task force from some of the participants. I wanted to address just a couple of these comments for the Task Force. First off, all mosquito control decisions are science based and are in response to real-time surveillance. Also, mosquito control professionals are highly trained and undergo continuing education in their field. Many of these professionals come from ecology and environmental science backgrounds are invested in protecting non-targets and the environment. As mentioned, an integrated approach is used and insecticides are only a small part of that approach. When insecticides are necessary, they are used judiciously and their effectiveness is constantly monitored. If they were not effective, they would not be used. In some cases, mosquito populations are building resistance to the limited number of products available for adult mosquito control. When this happens, it just emphasizes that mosquito control needs more (not less) adult mosquito control products in order to rotate and manage insecticide resistance. Mosquito control represents an extremely small percentage of overall pesticide usage and yet it is an easy target for anti-pesticide groups since it is often conducted by a public entity. In reality, these public entities are much more likely to follow all regulations, guidelines, and precautions to ensure public and environmental health are protected.

There were erroneous comments about non-target effects of several of the mosquito control products that are used. Bti is very specific to mosquito larvae when applied according to label directions in proper habitats. Bti can also be used to control certain midges and black flies; however, these insects would only be affected if the product was applied at different rates in different habitats. Scientific studies have already been done to show the lobster die-off was not caused by methoprene, so I'm not sure how this misinformation persists. There were several comments that claimed aerial adult mosquito applications are not effective. Aerial adult mosquito control is a huge effort and would not be undertaken if it did not work. There are a number of studies showing that aerial adult mosquito control is indeed effective and in very rural areas, it is more effective than truck-mounted ultra low volume spraying.

There are many different species of mosquito control and different species sometimes require different approaches. The primary vector species of

Eastern Equine encephalitis is extremely difficult to control and the residents of Massachusetts are very fortunate to have such a dedicated and professional mosquito control work force. If it were not for their efforts, the levels of EEE and other mosquito borne diseases in Massachusetts would be much higher. I hope the task force considers the scientific research that has been done and resists the temptation to fold to political pressure based on unfounded emotional fears. The next emerging mosquito borne disease is right around the corner, please do everything you can to ensure your public mosquito control is equipped with the tools it needs to protect your residents to the best of their ability.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 7:49 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	173.48.158.203
Unique ID:	802931542
Location:	

Name	Cecelia Doucette
Subject:	Mosquito Control
Comments:	Dear Sir or Madam, Please discontinue use of toxic chemicals for mosquito control. For all the spraying that's been done, there are still mosquitos. Public education is our best bet for protections. Kind regards, Cecelia Doucette

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 6:18 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	96.233.161.79
Unique ID:	803910516
Location:	

Name	David Greenberg
Subject:	21st Century Mosquito Policy

Comments:

Dear Members of the 21st Century Mosquito Task Force,

I am very apprehensive about the use of toxic pesticides to manage mosquitoes, and urge this Task Force to develop a science-based, ecological mosquito management policy.

Ecological mosquito management prioritizes preventative measures, and includes:

Monitoring and surveillance;
A strong focus on public education and personal protective measures;
Emphasis on eliminating breeding sites; and,
Consideration of local ecology.

A tiered approach to management includes non-toxic approaches, such as habitat manipulation and must be attempted before considering the use of toxic chemical solutions. Larvaciding should be conducted based on monitoring for predefined thresholds and adulticiding (spraying for adult mosquitoes) should be permitted only during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective.

Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underline the need for an approach that does not place these products at the top of the toolbox.

To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities.

Business as usual cannot continue. Unrestricted spraying of toxic

pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which Covid-19 attacks.

I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country - residents like myself will be watching closely to ensure this opportunity is not missed.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 28, 2021 4:25 pm
Browser:	Safari 14.1 / OS X
IP Address:	97.95.176.142
Unique ID:	800155091
Location:	

Name	Kay Masterson
Organization / Affiliation:	NOFA - MAss
Subject:	mosquito spraying
Comments:	Please stop aerial mosquito spraying and find other less harmful ways to manage the risks they pose. We need to take more personal responsibility to make smart choices in our landscaping and protect ourselves personally rather than blanket natural areas with chemicals that have known detrimental effects on other important aspects of our ecosystem.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 28, 2021 2:51 pm
Browser:	Chrome 90.0.4430.85 / OS X
IP Address:	65.96.75.50
Unique ID:	800086566
Location:	

Name	Colin Antaya
Organization / Affiliation:	Conservation Law Foundation
Subject:	Utah Physicians for a Health Environment report on mosquito pesticide spraying
Comments:	I request that the Task Force add to its record and fully consider the recent report published by Utah Physicians for a Health Environment on mosquito pesticide spraying. The report is easily accessible online (https://www.uphe.org/priority-issues/mosquito-pesticide-spraying/) The report's main findings include: -Pesticides in general, including those used by SLCMAD, represent a widespread risk to human health even at low doses, especially for fetuses and infants. -The VOCs from pesticide spraying is a significant contributor to local air pollution. -Spraying is not effective in reducing mosquito populations. -We must not allow a cure worse than the disease. The incidence of severe outcomes from West Nile Virus is so low that preventing those outcomes should not be allowed to eclipse the long list of other health and environmental concerns from pesticide use. -Spraying does not reduce the incidence of WNV. -Claims of safety for pesticide spraying use faulty logic and outdated, faulty science. -There are multiple oversights, inadequacies, omissions, inconsistencies, and errors in the SLCMAD's EA. -Pesticide spraying has adverse impacts on beneficial insects, bird populations, wildlife, the ecosystem of the Great Salt Lake and beyond -There are Better Ways to Control Mosquitoes

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 6:12 am
Browser:	Firefox 88.0 / Windows 8.1
IP Address:	162.200.56.164
Unique ID:	802898857

Name	Michele Colopy
Organization / Affiliation:	LEAD for Pollinators, Inc.
Subject:	Stop Blaming Beekeepers
Comments:	Please see attached PDF
File	https://massgov.formstack.com/admin/download/file/10526673432

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 6:09 am
Browser:	Firefox 88.0 / Windows 8.1
IP Address:	162.200.56.164
Unique ID:	802898149

Name	Michele Colopy, Executive Director
Organization / Affiliation:	LEAD for Pollinators, Inc.
Subject:	Comment to the Task Force
Comments:	Please see the attached PDF
File	https://massgov.formstack.com/admin/download/file/10526664841

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 2:55 pm
Browser:	Chrome 88.0.4324.182 / Windows 8.1
IP Address:	98.229.37.69
Unique ID:	804449921

Name	Jean Lemieux
Organization / Affiliation:	Massachusetts Association for the Chemically Injured, Inc.
Subject:	RE: Public Comment on the listening session for public comment
Comments:	Jean A. Lemieux, President for the Massachusetts Association for the Chemically Injured, submits Public Comment to the Mosquito Control Task Force. Attached document.
File	https://massgov.formstack.com/admin/download/file/10551267215

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 28, 2021 5:35 pm
Browser:	Chrome 90.0.4430.85 / Windows
IP Address:	173.76.104.50
Unique ID:	800192062
Location:	

Name	Barbara Katzenberg
Organization / Affiliation:	Town of Lexington
Subject:	Balancing risk from mosquitoes with biodiversity in larvicide practices
Comments:	In reviewing current practices, it appears that even when there have been no recent documented cases of mosquito-borne diseases in an area, it is standard practice to lower the number of mosquitoes by killing larvae in wetlands. The use of Bti, while non-toxic for humans, does affect other insects and has unknown effects on overall biodiversity in the areas where it is applied. Mosquitoes and other aquatic Diptera killed by Bti are food for birds, bats, and amphibians. During an era of mass extinction of animal species, I believe we should examine the effects larvicide practice has on overall biodiversity and review whether it could be done in a more limited fashion without putting humans at risk.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 7:43 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	66.31.250.186
Unique ID:	802929523
Location:	

Name	Bradford Chase
Organization / Affiliation:	MA Division of Marine Fisheries
Subject:	Cooperative work with CCMC
Comments:	I am the Diadromous Fish Project leader for the MA Division of Marine Fisheries. Our regulatory responsibilities for diadromous (sea-run) fish includes ensuring they have safe passage from marine waters to freshwater spawning and nursery habitats. This work includes annual stream maintenance to remove debris jams, vegetation overgrowth and tree falls that can block these spring fish migrations. Stream maintenance has been conducted for 100s of years as a necessary action to keep diadromous fish runs viable. In some locations the attention paid to this need has diminished partly in response to a harvest ban for river herring in 2005 and also due to recent changes in the culture of coastal communities. The interests of my agency and CCMC control can overlap when it comes to stream maintenance. Keeping water flowing in coastal streams is needed for fish passage, reducing mosquitos, and the overall health of aquatic life. In recent years, we have worked cooperatively with CCMC at 4 locations on Cape Cod where mosquito control and fish passage interests connect. Further, the field staff of CCMC are very knowledgeable about they dynamics of watershed drainage and water control. Our discussions with CCMC staff over stream flow issues benefits both agencies to better understand hydrologic conditions in these Cape Cod watersheds. I recommend that DMF and CCMC continue to work together in the future at locations where mosquito control and fish passage issues intersect. Further, it would be beneficial to create a more structured process where the agencies get together annually to discuss target locations where proactive restoration work could be planned and specific management actions to support stream flow at other locations. Thank you, Brad Chase Senior Marine Fisheries Biologist brad.chase@mass.gov

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 19, 2021 5:39 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	66.31.29.232
Unique ID:	794713914
Location:	

Name	Theodora Francis
Organization / Affiliation:	Museum of American Bird Art
Subject:	Mosquito spraying
Comments:	I think the wide scale spraying has too toxic an effect on every aspect of nature and wildlife. It should be discontinued.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 7:25 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	73.167.238.24
Unique ID:	803935128
Location:	

Name	Gwenevra Nabad
Subject:	Mosquito Control
Comments:	Hello, I am a gardener and small farmer in MA and I hope that you will not be spraying poisonous mosquito spray over MA. AT least...Western MA! Much of Western MA has small organic farmers who are trying to feed people. there are harmless biological ways to control mosquitoes, including high levels of rosemary, basil, tansy, peppermint, and more herbs that have oils that repel mosquitoes. People can clean up their yards and not leave buckets or pools of water around. Spraying for mosquitoes destroys the habitat not just for mosquitoes. It gets in the soil and leaches up into the plants, which uptake everything in the soil, going into the food we are growing. It also causes cancer and other health problems with the nervous system. There's no reason not to spray safely. thank you, Gwenevra Lodi Nabad

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 4:50 pm
Browser:	Chrome 90.0.4430.93 / Windows 7
IP Address:	71.192.27.32
Unique ID:	804507452
Location:	

Name	Martha Nathan
Organization / Affiliation:	Climate Action Now Western Mass
Subject:	Aerial spraying
Comments:	Climate change and environmental destruction are existential and public health threats. Preserving our soils and trees as a way to sequester carbon means we have to care for them. Preserving our pollinators preserves our food supply. Blanket spraying of pesticides seems to be one more symptom of a world that promotes financially-motivated "quick fixes", with nature as a resource to be used and abused, without considering long range consequences for generations to come. According to the national Centers of Disease Control and US Environmental Protection Agency, spraying of pesticides to control adult mosquitoes is the least effective, and most environmentally damaging method to control mosquito disease. Many of the ingredients in mosquito pesticides (such as synthetic pyrethroids) have not been tested for health and environmental impacts. One is a known lung irritant (sumithrin) and one is considered to be a possible human carcinogen by the EPA (piperonyl-butoxide).

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 2:53 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	71.233.136.174
Unique ID:	804449112
Location:	

Name	Wendy Hollis
Subject:	Mosquito spraying
Comments:	I am against widespread spraying for mosquitoes. We already went through this with ddt and found it to be a mistake. Mosquitoes are an important part of our ecosystem and should not be indiscriminately wiped out. The toxic materials used are likely to harm us as well as other living beings. This type of poisoning is never a good idea. Alternate methods of control can be employed. Thank you

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 20, 2021 10:45 pm
Browser:	Chrome 90.0.4430.85 / Windows
IP Address:	8.2.72.123
Unique ID:	795288939
Location:	

Name	dorothy McIver
Subject:	Aerial Spraying of Mosquitos
Comments:	I am writing to say I a totally opposed to the aerial spraying of mosquitoes. This is more dangerous to our health and that of other beings than the diseases the mosquitos transmit which usually affect a very small percentage of the population, whereas aerial spraying will have an affect on everyone who lives where spraying happens. These chemicals will drift onto our gardens and farms, many of which are organic, and contaminate the food we eat, they will poison our pollinators and birds and other living creatures and the spray will be in the air we breathe, and likely will make it into our drinking water, and it will also be spread by the wind to other areas. It is an antiquated method that needs to be ended. There are other ways of managing mosquitoes-having our regional task force involved in locating and destroying the larvae in critical areas, by educating people to not leave standing water in containers or tires, to avoid being out at dawn or dusk if disease is in the area, dressing properly and using insect repellent that is non toxic. but effective- there are many available And there are some safe products people can use around. their homes as well to eliminate mosquitoes. We need to change this law and find safer ways to deal with mosquito borne diseases.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 19, 2021 3:12 pm
Browser:	Chrome Mobile 87.0.4280.141 / Android
IP Address:	108.20.35.102
Unique ID:	794649539
Location:	

Comments:

I support alternate methods. My area was heavily sprayed and then we noticed a decline in frogs for the first time in our 14 years living here. The planes kept going back and forth. My brother who lives one street over found dead hummingbirds that week as well. It was eerie how quiet it was. Made me think of "silent spring" in all the ways.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 12:48 pm
Browser:	Chrome 90.0.4430.85 / OS X
IP Address:	73.89.203.106
Unique ID:	803730649
Location:	

Name	Gina Siepel
Subject:	mosquito control: adopt alternate plan
Comments:	As a resident of the state of Massachusetts, I urge lawmakers to consider alternatives to spraying insecticides to control mosquito populations. These insecticides are harmful to humans, animals, birds, pollinators, and many other organisms. We lose more than we gain by doing this. Let's do the work now of figuring out better ways to deal with the problem - instead of figuring it out in twenty years, motivated by regret for the damage inflicted by actions taken in 2021.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 5:12 pm
Browser:	Chrome 92.0.4484.0 / Chrome OS
IP Address:	216.195.26.237
Unique ID:	804516870
Location:	

Name	Seana Parker-Dalton
Subject:	Mosquito Spraying
Comments:	I am very concerned about the impact of mosquito spraying on native insect populations, which are already in collapse. Please consider alternative solutions.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 7:51 am
Browser:	Mobile Safari 14.0.3 / iOS
IP Address:	97.95.181.87
Unique ID:	802932432
Location:	

Name	Richard A Callahan
Organization / Affiliation:	Massachusetts Bee and Worcester County Bee
Subject:	Impact of aerial and motorized insecticide fogging on the food web.
Comments:	Much has been written about the devastation caused by specific insecticides. With very few exceptions modern insecticides work by blocking neural transmissions essential to invertebrate as well as vertebrate life. Recent surveys throughout the world have shown that insect populations of all kinds have been reduced by as much as 40%. Not surprisingly predators including bird, reptile and amphibian populations have been drastically reduced as well. Even common birds such as Robins and Starlings have drastically declined. The application of nerve toxins via fogging and aerial spraying is indefensible. Evidence that it effectively reduces human illness is not present but the enormous destruction of the natural world is all around us and augmented by common sense. Insecticides kill insects indiscriminately. Regionally applying insecticides regionally damages the foundation of the food web damaging all wild life in the entire region. The cost in dollars as well as in ecological damage is high; the benefits are unproven. Stop the spraying.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 9:56 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	199.135.229.73
Unique ID:	802991556

Name	Stephen Spear
Organization / Affiliation:	USDA - Natural Resources Conservation Service
Subject:	Mosquito control Projects and wetland restoration
File	https://massgov.formstack.com/admin/download/file/10527778575

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 27, 2021 6:09 pm
Browser:	Chrome 90.0.4430.85 / OS X
IP Address:	75.69.117.225
Unique ID:	799638954
Location:	

Name	Montserrat Archbald
Subject:	mosquito management
Comments:	Dear Senator Comerford, I am unable to participate in the meeting due to my work schedule, but I would like to submit a comment on mosquito management. I am commenting as a conservation commissioner, beekeeper, and environmental activist. I appreciate your acknowledgment that the state's current mosquito control system does not make sense, and I wholly support the Mosquito Control for the 21st Century Task Force. The task force is made up of all possible stakeholders, and your bill takes into account the many overlapping and cascading effects of different methods of mosquito control. Too often we try to solve one problem with a short-sighted, simplistic, ham-fisted "solution." Such is the case with blanket aerial pesticide spraying in response to the possibility of arbovirus. Little if any consideration has been given to the immediate and long-term effects on respiratory health, maternal and infant health, wetlands, pollinators, etc. This problem demands a comprehensive approach that takes myriad factors into account, as well as the likelihood that mosquito-borne illnesses are likely to increase as our climate warms. Thank you for representing me and my family. Montserrat Archbald

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 1, 2021 10:22 am
Browser:	Chrome 91.0.4472.77 / Windows
IP Address:	72.93.84.93
Unique ID:	816586742
Location:	

Name	Louise Hetzler
Organization / Affiliation:	Town of Westborough, MA
Subject:	Comments shared with local select board
Comments:	My name is Louise Hetzler and I live in Westborough. I am here to urge you to vote against aerial and ground spraying of mosquitoes with synthetic pyrethrins. In addition to containing carcinogenic PFAS, synthetic pyrethrins such as Resmethrin and Anvil10+10 are toxic to bees and fish, not to mention butterflies and other pollinators, dragonflies, fireflies, and songbirds that eat poisoned mosquitoes. Dragonflies are beautiful and they eat mosquitoes! Vote for the earth and against poisoning the earth. Don't do this for me, or for you.Do it for your grandchildren. Future generations are counting on us to do the right thing. Last year Minnesota passed a bill that offers grants to homeowners willing to transform lawns into bee gardens. For the past 10 years I have transformed my backyard into a sanctuary for bees, first at my Windsor Ridge organic patio garden, and currently at my Endicott Drive organic mint garden. My mint plants attract bees. The two times I saw the Central Mass of Mosquito Control truck come through the neighborhood in the last 5 years, my hundreds of bees and other pollinators disappeared for the rest of the season. Even with my property excluded, they still disappeared! There is an alternative that is nontoxic to bees and other beneficial insects, a garlic product called Mosquito Barrier that is used all over the world. Disneyworld uses garlic for mosquito control. There are no mosquitoes on garlic fields. Garlic is toxic to mosquitoes. In 2019 the state used Anvil10+10, containing PFAS, in the aerial spraying of over 2 million acres, according to a Boston Globe article on 12/1/20. Many Southeastern Mass towns later found PFAS in their water. We need to protect nature. Fireflies are flashing and mating when spraying occurs. The insect apocalypse is happening now. We need to take drastic steps now to reverse it if we are to survive. The crisis of Covid has given us an opportunity to reset our climate agenda to work for healthy soil, water, and air. Please consider this golden opportunity to register by May 15th for the Municipality Opt Out of both ground and aerial spraying in Westborough. Thanks for your help!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 4:57 pm
Browser:	Chrome 90.0.4430.93 / OS X
IP Address:	73.4.6.60
Unique ID:	804510433
Location:	

Name	Jennifer Ladd
Organization / Affiliation:	--None--
Subject:	mosquito spraying
Comments:	I am very concerned about the impact of spraying on other pollinators for food - this could be very bad for our food system, especially out here in western Massachusetts where there are so many farms.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 4:55 pm
Browser:	Firefox 88.0 / Windows
IP Address:	65.96.242.205
Unique ID:	804509452
Location:	

Name	Ariel Elan
Organization / Affiliation:	Elected Town Meeting Member. Town of Montague
Subject:	Appropriate mosquito control measures

Comments:

Hello!
I OPPOSE the spraying of any pesticides for mosquito control, by any means and under any circumstances.

I believe that alternatives to spraying exist that are as effective or more effective in reducing the incidence of mosquito-borne illnesses, including EEE and WNV, than any type of spray that blankets entire areas.

I would like to write several pages explaining my reasons, and would include links to legitimate academic and scientific studies demonstrating the harmful effects of pesticide spraying on our pollinators -- especially honeybees; on our fish and shellfish stock; on our groundwater and aquifers; and on our human bodies as well.

That last harm comes in many forms -- most well-known is that sprayed pesticides can trigger and exacerbate asthma attacks -- which can be fatal as well.

My message today must be brief, and will lack the specific documentation I would prefer to include, because I have heard from a fellow advocate around these concerns that today at 5pm is your deadline for receiving comments.

IT IS ESSENTIAL that we take spraying OFF the TABLE for the Commonwealth and all localities, and devote our preventive efforts to strategies that the state has already documented ARE MORE EFFECTIVE in preventing outbreaks of EEE. These include eliminating standing water, and MOST IMPORTANT, educating the public on personal protection from mosquito bites.

From carrying battery-powered mosquito traps with us, to applying repellants to our clothing and bodies, THESE ARE THE PREVENTION METHODS WE MUST USE.

It is true that mosquito most mosquito repellants contain poisons, also. But IT MUST BE EACH INDIVIDUAL'S OR PARENTS' CHOICE to weigh the risks and benefits of all of the available methods of personal protection. And these choices DO include less-toxic repellants.

PLEASE REMEMBER: THE STATE ITSELF HAS DETERMINED THAT SPRAYING DOES NOT ELIMINATE ALL CASES OF EEE IN A SPRAYED AREA.

Poison to any life form is poison -- is stressful -- is weakening -- to the biological health of all life-forms. Our policy makers, especially in agriculture and in public health, should have learned that from the very evidence that Rachel Carson made famous in "Silent Spring", around 70 years ago.

Yet mosquito control with DDT was finally banned, and little else happened to prevent the chemical industry with its false promises of safety from releasing and/or incorporating more than 86,000 different chemical substances [https://www.epa.gov/tsca-inventory/about-tsca-chemical-substance-inventory] into our air, water, soil, foods, and virtually every human-made product we use in our lives -- from lipstick to building materials to packaging to fabrics to furniture to soap to electronic devices.

And that does not count chemicals released into our surroundings not as intentional components of anything, but as pollutants created in the manufacture and incorporation of these substances for their intended uses.

More than 20 years ago, CSPI [the Center for Science in the Public Interest] estimated that as many as 10 times as many distinct chemical substances as listed in the EPA inventory linked above are in use, in the United States alone.

To the extent that the harm of ANY of these compounds or extracts have been studied for safety to humans or to any other organism, the evaluation has only looked for single-cause, very-short-term harms.

But single-cause-single-effect is rarely how our health is harmed. Our bodies are delicate ecosystems that depend on millions of interactions among enzymes, hormones, neurotransmitters, their receptors; cell membranes, mitochondria, and other key structures and components in our bodies -- each of which in turn depends on interactions among cell membranes, electrical signals, proteins and their coatings, and ultimately the roles of RNA and DNA in all of this interactivity.

As medicine is finally recognizing in the case of known endocrine-disruptors such bisphenyl-A and other bisphenyls, the disruption of one or more of these profoundly interconnected relationships or processes can cause major distortions in human development -- even in personality, intellect, and mental health -- as well as metabolic failure, cancers, other illnesses, and deaths.

There is absolutely no possible rationale for imposing these risks and harms on all of the residents of the Commonwealth to prevent, specifically, deaths by one or two causes, which is the EEE or WNV virus.

Look at what is happening right now with COVID-19. It is a deathly scourge -- and is transmitted on the BREATH. Yet no one would suggest filling the air we all breathe with a gas that would make us sick in other ways, in order prevent COVID.

Another lesson from the pandemic is that brilliant and fast work can develop successful anti-viral vaccines. Let's turn our policy and funding efforts to EEE and WNV vaccines.

Finally -- VERY IMPORTANT -- In the future, our state government MUST PUBLICIZE MUCH BETTER THAN THIS INITIATIVE WAS PUBLICIZED that something like mandatory mosquito control spraying might be imposed on us. Everyone in the state should have been informed, at the time this Task Force was created, that it was happening, and how WE could participate!

There is no excuse for many of us who care only learning about this now, for the first time.

PLEASE EXTEND the COMMENT and also the MUNICIPAL OPT-OUT DEADLINES.

Thank you for your attention and consideration!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 20, 2021 12:48 pm
Browser:	Chrome 89.0.4389.128 / Windows
IP Address:	96.233.175.188
Unique ID:	795071811
Location:	

Name	Bruce Hawkins
Subject:	Mosquito Control
Comments:	Like everyone else, I object tohaving the critters around. But they would not exist if they did not have a place in the ecology. We need to consider what is harmed by removing them as well as the harm done by the control measures and find a balance.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 4:37 am
Browser:	Chrome 90.0.4430.93 / Windows 7
IP Address:	73.215.199.36
Unique ID:	803522148

Name	Scott Crans
Organization / Affiliation:	NJDEP Office of Mosquito Control Coordination
Subject:	Professional Mosquito Control Operations
Comments:	Providing professional mosquito control to protect residents in a given area (County/State) is an activity in the public interest that requires year round attention. This is a full time activity taking advantage of a number of management approaches to achieve nuisance reduction from biting mosquitoes and the suppression of disease transmission. Comprehensive coverage of the areas producing mosquitoes (larval habitats) is essential to successful management of pest species. Coordination of these activities using available federal, state and local resources, where appropriate, is key to the long term efficient management efforts. Mosquito species are numerous within the northeast. There are also numerous pathogens some of these mosquitoes can transmit. The disease cycles are complicated and vary from region to region. A science based approach to management is critical in efforts to target the mosquitoes responsible for causing severe nuisance and those responsible for transmitting disease should it be cycling within the environment.
File	https://massgov.formstack.com/admin/download/file/10538653034

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 12:41 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	50.245.26.65
Unique ID:	803077841
Location:	

Name	Kaitlyn ODonnell
Organization / Affiliation:	Norfolk County Mosquito Control District
Subject:	Information and Outreach
Comments:	Thank you for the listening session, I think it is important to hear the concerns of the public since mosquito control often has such a pervasive negative reputation. A lot of the comments and questions made by people concerned for the environment are easily addressed and answered and I think it would be helpful if we were able to get that information out to them in a digestible way. I also heard a lot of inaccuracies and misinformation that should be corrected. It is hard to change people's minds, but it is important that we give them the information we are working with to inform our mosquito control actions so they know where we are coming from. There seems to be a lot of confusion and misunderstanding about what the mosquito control projects do and what the state does. I think this can be cleared up as well with more communication. Lastly, I want to respond to a lot of the people speaking from conservation commissions and tell them that most of the people who work in mosquito control got into this job because we love the outdoors and have a lot of the same goals that they do which is why we use informed integrated management.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 6:13 am
Browser:	Firefox 88.0 / Windows 8.1
IP Address:	162.200.56.164
Unique ID:	802899097

Name	Michele Colopy
Organization / Affiliation:	LEAD for Pollinators, Inc.
Subject:	Cumulative Impacts of Pesticides to Bees
Comments:	Please see attached PDF
File	https://massgov.formstack.com/admin/download/file/10526676273

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 1:09 pm
Browser:	Safari 14.1 / OS X
IP Address:	73.253.109.50
Unique ID:	804386831
Location:	

Name	David and Susan Clark
Subject:	Mosquito Control Task Force responsibilities
Comments:	Mosquitoes are a serious problem for those of us who are outdoors a lot and the diseases they can transmit are threatening. But most methods to control mosquitoes in any of their stages are dangerous to our environment. Controls targeted to a genus or family of mosquitoes are imprecise and usually deadly to other organisms. We urge the Task Force to employ minimal controls, especially pesticides to avoid doing harm. Humans have to deal with inconvenience and the health threats from these insects, just as we deal with traffic accidents.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 12:04 pm
Browser:	Firefox 88.0 / Windows 7
IP Address:	8.2.72.42
Unique ID:	803058590
Location:	

Name	Margaret Hall
Organization / Affiliation:	Greening Greenfield
Subject:	need for better info on opt-out
Comments:	As can be heard from many of the speakers, there is a great need to get questions answered. Yes, this was a public listening session, but we in the communities who have to make a decision on opt-out by May 15th, need information before May 15th. In fact, the Greenfield City Council is meeting tomorrow, May 4, so an immediate response is urgent. While appreciating the overall IPM (IMM) approach, many in the Greenfield community believe that as an agricultural area with a strong desire to protect our pollinators, aerial spraying and even ground-based spraying of adulticides is rarely appropriate. Greening Greenfield is currently engaged in a major educational campaign to protect and increase pollinators. www,GreeingGreenfieldMA.org Greenfield has joined the new Pioneer Valley MCB, but we are unclear about the process of opting out of aerial spraying. It is my current understanding that if we want to opt out of spraying, we still need to apply to the state to opt-out, and joining PVMCB will be considered a strong factor in approving our application. But that alone does not guarantee that the application to opt-out will be approved. Is that correct? If PVMCB has a sufficient educational component, does that then become sufficient to ensure approval of a municipal opt-out request? And I, personally, agree with the speakers who say that we need to understand the triggers that would cause spraying, that individuals should have an absolute right to opt-out of spraying on / over their property, and with those who encourage an opt-in municipal program instead of an opt-out.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 3:16 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	108.7.196.77
Unique ID:	803804194
Location:	

Name	Carolyn Bishop
Subject:	Mosquito Control
Comments:	In 1984 I was appointed to a Citizen's Advisory Committee formed to develop a Generic Environmental Impact Report on Mosquito Control in the Commonwealth (EOEA#5027) in coordination with two professors of Entomology at UMass Amherst. It took the better part of a year for the CAC to refine the Scope against the recalcitrant Reclamation Board of the period. The various Mosquito Control Boards are still under the state Reclamation Board AND Mosquito Control Board. It seems that not much has changed since then with the emphasis on aerial spraying of pesticides. As one member of the CAC said "Aerial spraying is like going after a butterfly with a machine gun". The drop of poison has to hit the mosquito to be effective. Meanwhile the spray lingers in the environment killing non target species, aquatic life and problems in humans.. Far more effective are the larvicides such as Bti and public education about eliminating standing water. A complicated issue but the best results involve common sense and not hysteria!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 25, 2021 10:55 am
Browser:	Chrome 89.0.4389.114 / OS X
IP Address:	75.68.212.228
Unique ID:	797045092
Location:	

Name	Catherine Martin
Organization / Affiliation:	Town of Sterling BOH
Subject:	opting out of spraying question
Comments:	I've had a few residents concerned about the spraying. I'll be listening for information to help them understand the reasoning behind the spraying and how the town can make the choice to 'opt out' for 2022.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 6:06 am
Browser:	Firefox 88.0 / Windows 8.1
IP Address:	162.200.56.164
Unique ID:	802897639

Name	Michele Colopy
Organization / Affiliation:	LEAD for Pollinators, Inc.
Subject:	Concerns for Pollinators
Comments:	Please see the attached PDF
File	https://massgov.formstack.com/admin/download/file/10526658944

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 4:43 pm
Browser:	Chrome 89.0.4389.90 / Linux
IP Address:	172.58.220.132
Unique ID:	804504026

Name	Martin Dagoberto
Organization / Affiliation:	on behalf of coalition partners
Subject:	May 3, 2021 Public Listening Session, Written Comments
Comments:	Please find the attached PDF containing written comments, submitted on behalf of our coalition partners. Please let me know if the file didn't come through: marty@nofamass.org
File	https://massgov.formstack.com/admin/download/file/10552017699

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 19, 2021 3:53 pm
Browser:	Firefox 87.0 / Windows
IP Address:	24.60.221.206
Unique ID:	794668195
Location:	

Name	Anca Vlasopolos
Subject:	Mosquito control
Comments:	I urge all decision makers to consider the scientific evidence for the efficacy and especially the environmental impact of scattershot spraying against mosquitoes. DDT was proven to be a horrendous hazard to human health and the health of the environment. Even such limited-use weed killers like Roundup are having devastating effects on amphibian life and thus on the chain of predation.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 28, 2021 1:57 pm
Browser:	Mobile Safari 14.0.3 / iOS
IP Address:	108.49.75.233
Unique ID:	800042430
Location:	

Name	Jill Phan
Organization / Affiliation:	Resident
Subject:	Keep up the good work!
Comments:	I am so appreciative of your free spraying program. I am surrounded by wetlands and with a combination of your program and other control measures my family is able to use our backyard. I appreciate the ability to easily submit an online request, I can see the schedule, and I receive a notice in my door the day of the spraying. My only request would be to accept requests prior to May 30 as my area is extremely buggy before the first truck is able to visit me. Thank you!!!!!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 26, 2021 3:05 pm
Browser:	Chrome 90.0.4430.85 / OS X
IP Address:	47.14.24.255
Unique ID:	797556110
Location:	

Name	Bill Mitchell
Organization / Affiliation:	Resident of Pepperell
Subject:	Environmental responsibility
Comments:	I strongly oppose spraying toxic chemicals in an attempt to control mosquito or tick populations. There are better means of mitigation available and these toxic chemicals pose risks to many living things, including humans.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 22, 2021 9:14 am
Browser:	Chrome Mobile 90.0.4430.66 / Android
IP Address:	71.235.197.137
Unique ID:	795929052
Location:	

Name	Laura Giard
Subject:	Mosquito control
Comments:	Thank you for reading this. I am deeply concerned about the changes that have been made to this program. I am fortunate that our town has opted out, however, I am very concerned that the DCR does not have an option to opt out. DCR manages a large percentage of land in my town, therefore the town opting out doesn't seem to mean much. I am very worried about the effect this program has on beneficial insects and pollinators (and the species that depend on them) as well as on human health. We are already seeing significant declines in the insect population.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 6:01 pm
Browser:	Chrome 70.0.3538.67 / Windows
IP Address:	73.167.185.1
Unique ID:	803904958
Location:	

Name	janet sinclair
Comments:	I am opposed to spraying chemicals for mosquito control. People can choose to protect themselves from mosquito, but I should not be forced to be exposed to toxic and harmful pesticides.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 5:00 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	141.154.72.5
Unique ID:	804512028

Name	Dorothy McGlincy
Subject:	Comments on Mosquito Conrol
Comments:	Refer to attached letter. Thank you.
File	https://massgov.formstack.com/admin/download/file/10552132764

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 3:40 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	96.233.175.253
Unique ID:	803816822
Location:	

Name	Laura Kaye
Organization / Affiliation:	Northfield, MA
Subject:	opting out of spraying
Comments:	I urge you to make it easy for towns to opt out of mosquito spraying. There is much evidence that spraying is detrimental to the environment and there are options for control that do not involve poisons (even the most benign). Our town was given very little time to take the steps necessary to make an informed decision (our elected officials agree). In this era of a global pandemic it is increasingly evident that all systems of life must be considered intelligently. This includes mosquitos who, though they are annoying and sometimes carriers of disease are also part of the interconnected food chain in our wild places - which too are necessary to sustain human life on the planet. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 6:10 am
Browser:	Firefox 88.0 / Windows 8.1
IP Address:	162.200.56.164
Unique ID:	802898517

Name	Michele Colopy, Executive Director
Organization / Affiliation:	LEAD for Pollinators, Inc.
Subject:	Beekeepers Are Impacted by Mosquito Control Chemicals
Comments:	Please see attached PDF
File	https://massgov.formstack.com/admin/download/file/10526669219

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 21, 2021 9:49 am
Browser:	Safari 14.0.3 / OS X
IP Address:	128.119.202.225
Unique ID:	795462124
Location:	

Name	Ryan Duggan
Comments:	I am a big advocate of the task force, and think it's so important to have the stakeholders such as beekeepers and environmental quality based folks involved to represent valuable lives and resources

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 1:27 am
Browser:	Firefox 88.0 / Windows
IP Address:	73.47.253.211
Unique ID:	804025735

Name	Susan Phelan
Organization / Affiliation:	GreenCAPE
Subject:	Mosquito Control Task Force
Comments:	Attached please find public comment for your consideration-
File	https://massgov.formstack.com/admin/download/file/10545163500

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 2, 2021 11:02 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	47.14.105.97
Unique ID:	802689210
Location:	

Subject: private property mosquito control

Comments: Our mosquito control company offers a pesticide free service (garlic oil). I'm sure others do, too. Please take this into account before banning all private mosquito control, if that's the intention of this task force.

Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 30, 2021 2:25 pm
Browser:	Chrome 90.0.4430.85 / Windows
IP Address:	24.34.133.123
Unique ID:	802124221

Name	Emily Beebe
Organization / Affiliation:	Town of Truro Health and Conservation Department
Subject:	Cape Cod Mosquito Control Project
Comments:	see attached letter
File	https://massgov.formstack.com/admin/download/file/10516788416

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 12:47 pm
Browser:	Chrome 90.0.4430.85 / Windows
IP Address:	72.79.239.8
Unique ID:	803729711
Location:	

Name	Stephanie Gelfan
Subject:	Mosquito task force..aerial spraying
Comments:	This op-out version of spraying is insane. It will not solve the problem of EEE. What it will do is further poison our water supply, poison us, and certainly poison many many beneficial insects, birds, mammals, and fish. As for EEE and the mosquitos, in the long term what spraying will do is wipe out the mosquito predators and only leave those mosquitos who can survive spraying. Just like antibiotic-resistant diseases, we will have created pesticide resistant mosquitos. Unfortunately, there is also alot of money to be made for a few people, and frankly, I think this is the only reason this bill has been passed. I urge you to stop this insane spraying. If nothing else, think of your descendants.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 5:01 pm
Browser:	Chrome 90.0.4430.85 / Windows
IP Address:	71.233.113.220
Unique ID:	804512256
Location:	

Name	Carole Horowitz
Organization / Affiliation:	Climate Action Now Western MA Farming, Forests, and Food Systems Working Group
Subject:	aerial spraying for mosquitos
Comments:	We are completely opposed to aerial spraying. At a time of mass extinction we should not be indiscriminately killing insects, birds, poisoning the food we eat, and harming other life, including human life. There are other recommended ways to handle the hazards of diseases spread by mosquitoes that do not include spraying. Please refrain from further damaging our planet. Enough is enough!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 8:33 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	71.234.189.43
Unique ID:	803957074

Name	Charles Eiseman
File	https://massgov.formstack.com/admin/download/file/10544230359

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 8:36 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	162.245.143.26
Unique ID:	803423191
Location:	

Name	Lee Ann Warner
Subject:	Opt out program
Comments:	I am a resident of the state living in Leverett and am discouraged to find that we now must opt out instead of opt in. I request you return to the previous opting in unless you can provide financial support to municipalities that need to develop an alternate plan. Spraying is the least effective means of mosquito control and it harms many beings including people. I am requesting that you look to more targeted methods including personal protective measures that can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides. I strongly oppose Anvil because it does more harm than good.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 1:52 pm
Browser:	Mobile Safari 14.0.3 / iOS
IP Address:	174.255.67.183
Unique ID:	804410575
Location:	

Name	Linda Hillson
Organization / Affiliation:	Lunenburg Pollinators Group
Subject:	Request to extend deadline
Comments:	I am writing to request an extension of the May 15th deadline for alternate municipal plans for aerial mosquito spraying. I reside in Lunenburg, MA. Thank you Linda Hillson

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 12:18 pm
Browser:	Firefox 88.0 / Windows
IP Address:	71.235.167.32
Unique ID:	803713689
Location:	

Name	Judith Wagner
Subject:	Mosquito Control
Comments:	Far from its name, this approach of mass aerial spraying of pesticides throughout our communities seems like a throwback to my childhood when children unwittingly and gleefully rode their bikes behind the mosquito spraying truck, exposing themselves to harmful chemicals. We know now that the delicate balances of our natural systems is already severely threatened by global warming and increasing weather disasters. The high winds in this area have increased noticeably in the past five years, for example. Please reconsider this plan and work with communities to craft approaches that take their specific needs and resources and locations in place to honor the forests, agriculture, parks, schools, health facilities and citizens, especially children, who live here. We are counting on your leadership and wisdom on this important issue.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 20, 2021 6:42 pm
Browser:	Safari 12.1.2 / OS X
IP Address:	24.60.190.31
Unique ID:	795226835
Location:	

Name	Ava Gips
Subject:	Please, no unlimited aerial spraying for mosquitos!
Comments:	As a MA Master Gardener, with my own big garden, I totally oppose unlimited aerial spraying for mosquitos. This would be horribly toxic for people, for bees, and all sorts of other pollinators. We now know so much about indiscriminate spraying of pesticides and its awful effects. There are other, far less toxic ways to combat mosquitos. Please change our state laws to reflect the health of all systems, including humans. Thank you, Ava Gips

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 30, 2021 12:20 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	73.149.214.161
Unique ID:	802066394
Location:	

Name	Scott Powell
Organization / Affiliation:	Board of Health, Bolton, MA Committee Member and Chair of Bolton Mosquito Control Committee
Subject:	Allow Towns to Have Additional Individual Control of Services Provided By Mosquito Control District
Comments:	First, Timothy Deschamps of the Central Mass Mosquito Control Project has been truly fantastic to work with. Our town finally approved joining the program after multiple attempts to gain approval at town meetings. He was extremely helpful in our efforts to gain support to join the program. We have a sizable population that is very opposed to spraying due to philosophical concerns regarding any attempts to influence nature, except through non-biological methods. We would like to have additional coordination between the town and the state program so that we can limit spraying unless absolutely necessary as supported by surveillance and science. I'm concerned that without this capability, the town will vote to opt out of the program in the future.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 1, 2021 10:13 am
Browser:	Chrome 91.0.4472.77 / Windows
IP Address:	72.93.84.93
Unique ID:	816582033
Location:	

Name	Robert Stevens
Organization / Affiliation:	Littleton, MA
Comments:	I live by a wetlands stream and do not want pesticides of any kind sprayed on or near my land. The combination of birds and dragonflies (which the pesticides kill) plus control of the water level next to my house keep the mosquito population to a level where we can go outside any time of the summer. I have been registered first with the town and now with the county as "no spraying" for the 40 years we have lived in the house. Why is registration not sufficient to ensure no spraying? The requirement is to put us pie plates or something that say no spraying. Since we have little or no advanced warning about spraying, it is challenging to meet this requirement.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 7:48 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	67.142.100.195
Unique ID:	803942762

Name	Jane Alessandra
Subject:	Feedback - corrected - from 5/3/21
Comments:	Please read this attached doc and not the one i sent an hour ago. I accidentally sent you the wrong revision, missing some key points. thank you, Jane Alessandra
File	https://massgov.formstack.com/admin/download/file/10544049469

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 18, 2021 1:18 am
Browser:	Chrome 89.0.4389.128 / Windows
IP Address:	71.234.42.112
Unique ID:	794043072
Location:	

Name	Sarah Pallas
Subject:	Mosquito spray kills bees and other good insects and is bad for the environment
Comments:	It is long past time to develop healthier alternatives. Spraying for any insect will potentially kill all insects, including those that fish, birds, and amphibians need to eat to survive and those that are essential for the healthy soil we need to grow our food and feed our grazing livestock. Many people have chemical sensitivities that will make them prone to chronic illness if insecticides are used. Eliminating standing water in old tires etc and using biological controls should be prioritized.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 12:17 pm
Browser:	Chrome 90.0.4430.93 / Windows 7
IP Address:	216.193.172.16
Unique ID:	804353399
Location:	

Name	Jodi Ross
Subject:	Mosquito Control

Comments:

I am writing to express my opposition to aerial spraying as a method of mosquito control, to explain my reasons for this position, and to describe what I would like you to do instead.

1) aerial spraying is not truly effective in controlling mosquito populations
2) aerial spraying harms many other species besides mosquitoes, some of which are beneficial to humans and harmful to mosquitoes
3) the pesticides used are harmful to humans directly
4) there are other, more effective ways to control mosquito populations

Spraying kills dragonflies and other natural predators of mosquitoes, causing a feedback loop where the species that naturally eat mosquitoes decline, and then the mosquito population rebounds stronger than ever.

Spraying harms other species as well, including bees, butterflies, and amphibians, which are already in decline. Frogs eat insects. Bees are critical pollinators. Monarch butterflies are in radical decline, and counts have estimated as much as 90% fewer in recent years.

The discovery of PFAS in the local (Swift River) elementary school has caused concern that our water supply here where I live is already contaminated with dangerous levels of the very substances the aerial spraying program is proposing to spray. Extreme caution should be exercised so as not to cause further contamination.

The real problem is standing water, and the way to reduce mosquito populations in residential areas is to launch a public education campaign about how to remove it. My yard was heavily populated with mosquitoes until I discovered that a neighbor had a canoe which was filling with water when it rained. We discussed it and they agreed to store the canoe upside down, so it would not collect standing water, and since then there have been no mosquitoes in our yards. This works! People just need to understand that they need to change the water in birdbaths, and cover or dump out other receptacles on a daily basis, and this will make a huge difference without any harm to anyone.

People can also be encouraged to plant or wear repellents, which will assist in protecting individuals in areas where there may still be mosquito populations once standing water is addressed. There are even some very safe substances that are shown to be as effective as DEET (such as certain extracts of catnip). Many options for safe, effective mosquito control are available, and people should be taught what they are.

EEE and WNV are extremely rare. According to CDC data, MA had between zero and 7 cases per year in the past several years, and zero deaths. Launching a campaign based on fear but devoid of facts will not improve the health or quality if life of residents. Educating the public about effective prevention will help, not only with preventing disease, but also with reducing the nuisance factor of itchy and annoying bites. People need to

understand the way mosquitoes breed, what naturally keeps populations in control, and how to protect themselves.

The use of aerial spraying will not serve any of those purposes.

The MassQuito site is a starting place for researching other methods: https://www.nofamass.org/massquito/

There are other ways, as well. Here's an article about the effectiveness of catnip vs DEET: https://www.sciencenews.org/article/how-catnip-plant-repels-insects-mosquitoes-chemical-receptor .

Here's the CDC data on EEE in MA (scroll down the page to see the chart for MA): www.cdc.gov/easternequineencephalitis/tech/epi.html

An acquaintance of mine told me that after her town was sprayed, the very active frog population in the wetlands abutting her property went totally silent. We cannot allow our policies to have unintended consequences like this. Let's have a rational decision-making process that takes into consideration all the effects of what we are doing, and makes use of facts rather than panic, to come up with something more effective and less dangerous than spraying.

Sincerely,
Jodi Ross
1 S Main St Apt 1A
New Salem, MA 01355

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 21, 2021 5:33 pm
Browser:	Firefox 87.0 / Windows 7
IP Address:	73.47.113.9
Unique ID:	795682577
Location:	

Name	Gary Powsner
Subject:	Mosquito Spraying
Comments:	I have had numerous discussions with state and utility company officials about this and feel that I understand the issues. Unlimited aerial spraying of dangerous mosquito pesticides is NOT the only or even a responsible approach to the those issues. The risks are enormous and there ARE alternatives. Please do not allow this toxic, unhealthy and environmentally damaging practice to continue.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 17, 2021 2:29 pm
Browser:	Chrome 89.0.4389.128 / Windows
IP Address:	173.76.180.75
Unique ID:	793940474
Location:	

Name	MARIA BARTLETT
Organization / Affiliation:	Andover Green Advisory Board
Subject:	Public education of safe alternative ways to control mosquitoes without pesticides
Comments:	There are many mosquito/tick control companies offering yard spraying services for special events and for regular 3-4 week residential yard spraying. Their "traditional" products are usually pyrethrins which are very neurotoxic to aquatic organisms and cause long-term adverse effects. Listed as acute and chronic health hazard to humans. Broadly sprayed in the yard, these products kill many pollinators and beneficial insects, in addition to targeted mosquitoes and ticks. Bifenthrin is considered a possible human cancer-causing substance. Some of the companies offer safer "natural" products. A number of these contain cedarwood oil as the active ingredient. Although included on the EPA list of minimal risk pesticides, it can be toxic to many insects and is not a harmless product. It is also often combined with other essential oils (thyme, rosemary, peppermint, spearmint). What is the relative safety of these products? I also came across cedaroil granules that can be spread around plants and on the lawn. Is this safe? One company is offering a "natural" product not containing cedarwood oil, but relying on garlic oil, peppermint, rosemary, and lemongrass to repel/kill ticks and mosquitoes. It would be extremely helpful for the public to have some guidance on the relative safety of these products to the environment, to beneficial insects, to humans and pets.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 9:18 am
Browser:	Safari 14.0.3 / OS X
IP Address:	216.59.170.117
Unique ID:	804179198

Name	Marcia Hart
Organization / Affiliation:	citizen
Subject:	mosquito control opposing

Comments:

Public Comment to the MA Mosquito Control Task Force:

I am writing to communicate that I am opposed to the one size fits all, opt-out State policy of increased mosquito aerial spraying in municipalities in the Commonwealth. I am disturbed at the lack of awareness I experienced in my own City; the comments at the hearing Tuesday that indicated many communities did not know of this change until very recently, and emails I am receiving from climate advocates across the State. I am in contact with many concerned and proactive citizens, primarily for climate advocacy issues and consider them to be more engaged in their communities and the State legislative process than most ordinary citizens are. Many are just becoming aware of this process and trying to find out if their municipalities are aware of the opt-out process and what has been done in their communities to address this issue. If this group is blindsided by this rule change there is something wrong with this process and the outreach done to communities by the State. I reiterate, therefore what I heard repeated in the public hearing, you really should extend the timeline for public and community engagement and decision making.

This is an issue that many citizens are very passionate about. I am concerned about the organic farmers who expressed horror at being sprayed. those with chemical sensitivity and asthma who expressed concern for their vulnerability to respond negatively to chemical exposure.

I live in East Gloucester, near lots of water and lots of air flow. In high summer I can sit on my deck at almost any time of day or night without wearing bug spray or being bothered by mosquitos. There is about a half an hour period in the early evening when I might get bothered so I generally stay inside then. I don't believe the risks of additional spray in this circumstance warrants the action of increased spraying. I can't address the needs of other municipalities. Some may require additional measures I am not aware of. However, risks also might not outweigh benefits anywhere of Anvil spraying. That should be determined locally and each distinct part of the State should be looked at individually so the population and needs of very different parts of the same State can each be met appropriately. In this instance, adequate effective notice of this choice has not occurred. In my locale, there is no question being sprayed would be over-kill. And I mean that quite literally, as organisms other than mosquitos are impacted by such poisons. We are in a biodiversity crisis which is global. We need to protect our pollinators, in particular, if we want a viable food system. And it disturbs me that the hoped for mosquito control achieved by aerial spraying has marginal effect in actually reducing mosquitos. Then again, should it be effective it will also be effective against lobsters, shrimp, clams, and snails.

As a nurse, I am familiar with the concept of risks and benefits with medication choices. Patients don't always understand that medications have risks, as well as benefits. The risk/benefit ratio should be considered

when medications are recommended in all cases. All medications have side effects for some. The benefits must be weighed against the risks, even if the risks are small. In medication prescribing, the individual is considered, their level of health, weight, age and hydration status are considered, as it is not a one size fits all situation. Some medical practitioners are very prudent on this issue, some more cavalier. I found in my career that medication side effects were most often dose related.

My point is that I believe this thinking applies to blanket chemical spraying. The potential risks of chemical exposure are never completely absent. Their use requires constant prudence and re-evaluation. Clearly, some substances are safer than others across a general population. Some will be toxic to almost no one. Some will be harmful to all, in a range from negligible to life threatening.

I believe in another medical principal. First do not harm.

I am appealing to you that in my part of the Massachusetts universe mosquito borne illness transmission is a nominal problem, both currently and historically. The potential harm from spraying here is most definitely higher than the risk of not spraying.

Our wetlands are delicate and complex environments with enormous biodiversity. They are increasingly valued for their ability to sequester carbon. Pesticides are increasingly being identified as lethal to pollinators, wildlife, aquatic life and humans. I have a Greenbelt community garden plot in Lanesville. I have cared for that as an organic garden for over 20 years. Aerial spray in Gloucester will negate these efforts. Lanesville, where my garden is, is about 17 minutes from where I reside and it is a different environment with a greater number of mosquitos than the nearly mosquito free East Gloucester. In my community garden in Lanesville, I avoid early morning and dusk, wear long sleeves, long pants tucked into boots and a hat. I spray only my boots with OFF to deter ticks. I grow a rosemary plant out there, specifically for the few times mosquitos or black flies bother me and rub a piece in my hair and around my ears. These are perfectly effective measures and allow me to spend lots of unfettered time in an area surrounded by woods in Lanesville.

The case numbers for mosquito borne disease remains low in Massachusetts. Why do we broadly use chemicals with incomplete knowledge of their long-term effects in a low-risk situation which can be primarily be mitigated with non-toxic measures?

Please reconsider this policy and its risk and benefits reality. Give

communities the time and information to adequately make this important decision for their unique communities. I am glad, particularly in the midst of this difficult pandemic that you are being pro-active but you must weigh the actual incidence of EEE and West Nile against the potential harm you may permanently impose on our eco-systems and vulnerable people. Public education and targeted treatment of disease prone communities is more sensible and should be appropriately determined by those communities for their locally known populations.

I hope you will choose protecting our gardens, watersheds, bees, wetlands, farms, yards, aquatic life and humans from chemical overuse. I am not convinced, in this case, that the chemical benefits outweigh their risks and we may not know the full extent of the ill effects until later. We have learned this over and over and over with once liberally used chemical substances that should have been used more judiciously, or not at all: DDT, tobacco, Roundup, malathion, plastic wrap, Tylenol, Thorazine, Thalidomide and many more. I prefer caution regarding chemical exposure. Please see attached article, as further comment.

I understand that environmentalists filed a complaint with Mass. IG's office saying aerial spraying does not work effectively and better techniques are the?elimination of breeding sites and larvae management on the ground.

I heard the above reflected in my community and across the State at the public hearing, please heed the rights and concerns of the residents who will be impacted and who do not look kindly upon being rained upon by poisons while they are sleeping. First do no harm.

Marcia F Hart RN
2 Fremont St
Gloucester

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 4:51 pm
Browser:	Chrome Mobile 90.0.4430.91 / Android
IP Address:	72.79.238.195
Unique ID:	804507562
Location:	

Name	Adrienne Bemak
Organization / Affiliation:	Amherst community
Subject:	Pesticides to control adult mosquitoes
Comments:	We are very alarmed by the use of these pesticides and urge you to halt the plans to spray May 15th. We live on Gray Street in Amherst and absolutely do not want these deadly sprays contaminating our home and community. Please hear this and seriously reconsider the use of these pesticides.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 21, 2021 12:09 pm
Browser:	Firefox 87.0 / OS X
IP Address:	73.68.187.35
Unique ID:	795532955
Location:	

Name	Jennifer Feller
Subject:	Please do NOT spray for mosquitos in large areas
Comments:	Hello - I'd like to weigh in on mosquito spraying as a concerned mom and citizen. I'm concerned that public fear about EEE and other vector-borne diseases is prompting widespread spraying that will do far more harm than good. I'd like to advocate for data-based decision making: what is the actual risk to human health? How does that compare to the long-term consequences of widespread pollinator death due to spraying (combined with other threats), or the damage to our clean air and water? Poisons in our ecosystem affect us all, and the risks are real, if harder to measure. Please know there is a strong constituency for NOT spraying, even. if we are not as loud as those calling for the state to "do something." Perhaps we could take a leaf from the history books, and do as my husband did when he was employed by the town of Rye NH to spray in the 80's: that team decided to spray fine water mist, to convince the community members that "something was being done," while quietly opening culverts to allow for sea water to clean out the marshes. Low and behold the "spraying" worked! We need to maintain our clean air and water for the health of our children and our ecosystem. Thank you!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 29, 2021 9:55 am
Browser:	Firefox 88.0 / OS X
IP Address:	71.233.18.11
Unique ID:	801429131

Name	J. Gregory Milne
Organization / Affiliation:	Cape Cod Mosquito Control Project Board of Commissioners
Subject:	Commission Comment Re: Communication with member towns
Comments:	Uploaded letter
File	https://massgov.formstack.com/admin/download/file/10507783169

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 5:35 pm
Browser:	Mobile Safari 14.1 / iOS
IP Address:	68.118.193.241
Unique ID:	803870862
Location:	

Name	Susan Garrett
Organization / Affiliation:	Regenerative Farming, Forests and Food Systems working group oh Climate Action Now, western Mass
Subject:	Spraying for mosquitoes in Western Mass is unnecessary and damaging to the environment
Comments:	While I recognize that there are serious mosquito borne diseases, the danger in the western part of Massachusetts is very low. There are much safer control measures such as education of the public on standing water or use of larvicides. Aerial spraying has been shown to be less effective than the above actions. And it exposes everything in the path of the spray to harmful chemicals. In addition, in low risk areas it is better to leave the mosquito alone. Although annoying it fills an important niche in the ecology of our area-food for birds and bats and more pollination than people realize.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 8:36 am
Browser:	Firefox 88.0 / Windows
IP Address:	50.208.180.163
Unique ID:	802954127
Location:	

Name	Stefanie Paventy
Organization / Affiliation:	Elder Services of Cape Cod & the Islands/AmeriCorps Seniors
Subject:	Cape Cod Mosquito Control Collaborates with AmeriCorps Seniors
Comments:	AmeriCorps Seniors is a national volunteer program for people age 55 and over. AmeriCorps Seniors RSVP of Cape Cod & the Islands has partnered with Cape Cod Mosquito Control Project for more than 10 years to conduct arbovirus surveillance on Joint Base Cape Cod. AmeriCorps Seniors volunteers have helped by trapping mosquitoes for Cape Cod Mosquito Control, as well as provide information to military personnel and their families on ways to reduce ideal reproductive conditions for mosquitoes. In addition, Cape Cod Mosquito Control staff have provided annual training sessions for both AmeriCorps Seniors volunteers and Massachusetts Air National Guard's 102nd Medical Group. Cape Cod Mosquito Control also presents on a nearly yearly basis at the AmeriCorps Seniors Winter Education Series to inform the public on the life cycle of mosquitoes, their preferred habitat, mosquito-borne illnesses, and ways to prevent mosquito reproduction on personal property. AmeriCorps Seniors enjoys working in collaboration with the Cape Cod Mosquito Control Project and looks forward to assisting them far into the future.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 3:29 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	66.97.168.85
Unique ID:	803161290
Location:	

Name	Betsy Evans
Organization / Affiliation:	self-employed
Subject:	Mosquito spraying
Comments:	I strongly oppose this spraying. I am an organic gardener, eat primarily organic, and am concerned about long term effects of this for children. We need to have local control over spraying. I have attached a letter below. Thank you for supporting local decision-making. Betsy Evans

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 4:11 pm
Browser:	Mobile Safari 12.1.2 / iOS
IP Address:	76.24.38.228
Unique ID:	804487963
Location:	

Name	Kathy Poulsen
Organization / Affiliation:	Pollinator Field And Very concerned citizen
Subject:	Mosquito Spraying
Comments:	Please ,no spraying!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 11:27 am
Browser:	Safari 13.1.2 / OS X
IP Address:	73.114.208.112
Unique ID:	804311561

Name	Patti Page
Organization / Affiliation:	Gloucester Opt-Out Initiative
Subject:	Mosquito Task Force - May 3, 2021 Public Listening Session Comments
Comments:	comments attached
File	https://massgov.formstack.com/admin/download/file/10549569888

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 3:37 pm
Browser:	Chrome 90.0.4430.85 / Windows
IP Address:	66.31.147.64
Unique ID:	804471567

Name	larry dapsis
Organization / Affiliation:	cape cod cooperative extension
File	https://massgov.formstack.com/admin/download/file/10551570813
File	https://massgov.formstack.com/admin/download/file/10551570814

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 8:34 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	97.80.116.81
Unique ID:	804144745
Location:	

Name	Amy Adams
Subject:	Time for a science-based, ecological approach to mosquito control!!

Comments:

Dear Members of the 21st Century Mosquito Task Force,

As a resident of Massachusetts, I am deeply concerned about the use of toxic pesticides to manage mosquitoes, and urge this Task Force to develop a science-based, ecological mosquito management policy to submit to lawmakers next year.

Ecological mosquito management prioritizes preventative measures, and includes:

Monitoring and surveillance
A strong focus on public education and personal protective measures
Emphasis on eliminating breeding sites
Consideration of local ecology
A tiered approach to management:
Non-toxic approaches, such as habitat manipulation must be attempted first
Larvaciding should be conducted based on monitoring for predefined thresholds
Adulticiding (spraying for adult mosquitoes) should be permitted only during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective
Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underline the need for an approach that does not place these products at the top of the toolbox.

To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities.

Business as usual cannot continue. Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as

the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which Covid-19 attacks.

I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country - residents like myself will be watching closely to ensure this opportunity is not missed.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 4:55 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	108.230.159.158
Unique ID:	803853595
Location:	

Name	Darcy Sweeney
Organization / Affiliation:	Regenerative Farming, Forests, and Food Systems of Climate Action Now, Western Mass.
Subject:	stop aerial spraying of mosquitoes, especially with Anvil 10+10
Comments:	Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underlines the need an approach that does not place these products at the top of the toolbox. To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	April 21, 2021 9:18 am
Browser:	Chrome Mobile 90.0.4430.66 / Android
IP Address:	71.235.197.137
Unique ID:	795447276
Location:	

Name	Lauta Giard
Subject:	Mosquito Control
Comments:	I am deeply disturbed that the aerial mosquito control program has changed so that towns need to opt out. These aprayings are so detrimental to insects and other species that rely on them. Also, not enough data is available about the health impact on humans and animals. Please consider changing this. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 1:02 pm
Browser:	Chrome 90.0.4430.93 / OS X
IP Address:	73.17.211.232
Unique ID:	803088483
Location:	

Name	Marc Schultz
Organization / Affiliation:	Self
Subject:	Thanks you and a request for information
Comments:	Great discussion on a difficult public health issue. Can you send me marcfschultz@yahoo.com, or publish the name of the speaker from the LSU lab who offered to provide additional information?

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 9:31 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	209.6.123.141
Unique ID:	804191895

Name	Mary Duane
Organization / Affiliation:	Massachusetts Beekeepers Association
Subject:	Mosquito Control Force for the 21st Century
Comments:	The Massachusetts Beekeepers Association respectfully summits these comments concerning Mosquito spraying in the Commonwealth
File	https://massgov.formstack.com/admin/download/file/10547084649

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 4, 2021 10:21 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	71.234.189.43
Unique ID:	803650790

Name	Julia Blyth
Subject:	Comments on 2021 process, protest against aerial spraying, suggestion for offering a la carte approach
File	https://massgov.formstack.com/admin/download/file/10540221225

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 12:49 pm
Browser:	Safari 14.0.2 / OS X
IP Address:	71.184.159.213
Unique ID:	803082181

Name	Pine duBois
Organization / Affiliation:	Jones River Watershed Association
Subject:	Mosquito Control Programs

Comments:

1) Assessments for efficacy MUST include impacts on the environment including: impacts on predators of mosquitoes including: Bats, Dragonflies, frogs and tadpoles, fish and eels, lobster, crabs, clams.

2) Impacts on those native species should also include the impact of losing them on the particular environment, such as pollination; species balance: ecosystem integrity.

3) Financial efficacy should be included. Given the financial and climate burden of constant truck spraying, and aerial spraying annually, this expense should be compared with ecological restoration activities that are more enduring and encourage an ecological balance.

4) The information from the Districts is not helpful for those trying to do ecological restoration. To say we have sites, but not disclose where those sites are, is very unhelpful. To have a couple of larvae trigger an aerial spray seems to be a panic driven reaction rather than a program that will bring us back to balance.

5) With climate change we have to work harder and faster to restore the environmental resources, not waste money and damage the environment further with ill-advised poison applications.

6) The revelation that PFAS is in the products and containers is an indication that we do NOT know all we need to know when imposing such wide-ranging impacts on Commonwealth Nature.

7) The Districts claim that they do Education. We never see education from them. Covid education is a model. If education is to be effective it has to be relentless and widespread. People are the cause for most spray events, and is not just for EEE and WNV--it is for outdoor parties and recreation. People can spray themselves and should be required to police their yards, buckets, pools, gutters and ways to attract native predators.

8) Please take the comments about lobsters to heart, and please help us boost the American eel.

9) Our Stormwater systems creates a huge problem. We need better management strategies and the Towns need help and financing to do that work!

10) “Opt-in”, not “Opt-out”! Extend the date!

American eel info and

Long version with life stages:
https://www.youtube.com/watch?v=r2MBn7JTIlo

Short version eating mosquito larvae :

https://www.youtube.com/watch?v=GpPpBwZ_s8A

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	December 7, 2020 3:48 pm
Browser:	Firefox 81.0 / OS X
IP Address:	73.149.22.143
Unique ID:	716369345
Location:	

Name	Jennifer Feller
Subject:	Mosquito control
Comments:	I'm a mother of two girls and spend a considerable amount of time near marshes and other sites where mosquitoes are likely to live and breed. I'm concerned, obviously, about mosquito-borne diseases, as well as other vector-borne diseases such as Lyme. However, I am much MORE concerned that they have clean water, clean air, and clean soil in which their food can grow. I do not support spraying of toxic chemicals. We can take preventive measures to keep ourselves safe from mosquitoes -- we can't protect ourselves from environmental chemicals that are sprayed into our air and water. Please consider alternative measures to control pests other than toxins. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	December 7, 2020 3:49 pm
Browser:	Firefox 83.0 / Windows
IP Address:	24.60.221.206
Unique ID:	716370115
Location:	

Name	Anca Vlasopolos
Subject:	Mosquito control
Comments:	Please be mindful of the health of all living things while you're trying to protect the public. While mosquitoes carry dangerous and sometimes lethal diseases, spraying with "forever chemicals" that cause indelible damage to humans and other life seems the same as dropping a bomb on an inhabited area to prevent it from getting flooded.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 3, 2021 9:04 am
Browser:	Firefox 88.0 / Windows
IP Address:	47.14.4.137
Unique ID:	802966424

Name	Sharon McCarthy
Organization / Affiliation:	Harvard Board of Health
Subject:	Mosquito Opt -out application
File	https://massgov.formstack.com/admin/download/file/10527453433

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 9, 2021 12:44 pm
Browser:	Safari 13.1.3 / OS X
IP Address:	108.7.230.86
Unique ID:	756442888
Location:	

Name	Al Maze
Organization / Affiliation:	NA
Subject:	Mosquito spraying
Comments:	There has been too much poisons spread over our state in the last 60 years. Time to re-evaluate the wide spread of pesticides.

PUBLIC COMMENTS RECEIVED

May 2021

THOUGHTS ON THE PVMCD MOSQUITO MANAGEMENT PLAN V.2 (05/17/2021)

(an earlier version of this document was prepared for the PVMCD meeting on 05/10/2021)

Dr. Stephen Frantz, Research Pathobiologist

I am with Global Environmental Options, South Hadley (formerly with: Dept. of Pathobiology, The Johns Hopkins University, Bloomberg School of Public Health; and Dept. of Environmental Health and Toxicology, School of Public Health, State University of New York). I am also on the Northeast Organic Farming Association/MA (NOFA/MA0 Policy Committee and a member of Climate Action Now's Regenerative Farming, Forests and Food Systems Working Group.

Pathobiology is the study of disease systems, from etiologic agents to sociopolitical entanglements, all of which are part of the total causality complex. To maintain scientific integrity and public trust, mosquito management measures conducted by the Pioneer Valley Mosquito Control District must be based on scientific data. With accurate data, a management plan is possible. Without it, the program becomes hit and miss guesswork.

What sort of data are necessary to satisfy an informed public and the scientific community? It starts with surveillance; a detailed, complicated system, the key elements of which should include:

- Where will trapping occur - exact geographical locations and basic habitat type (e.g., parks, golf courses, undeveloped wood lots, sewage treatment plants, dumping stations, and swamps & temporary wetlands associated with waterways) in the specified community?
- What type of traps will be used (Gravid, Light, Resting, other)?
- Will 3 traps (as noted in M. A. O'Leary's letter 05/05/2020 to K. Foster) be set in each location, and how many locations per trap night?
- Will traps be set on the ground (~1m) or elevated (~6-7m) and how far apart?
- How many days/nights (specific hours and dates) will trapping occur per trap location? Will it be once per week for 12 weeks for all of June through all of September?
- Will weather conditions (temperature, precipitation & length of daytime) be recorded for the trapping period(s)?
- Will the trap success be recorded per location per species?
- Will mosquitoes be identified that are vectors of WNV or EEE per trap per location?
- Will the number and % of the females (the biters) infected WNV or EEE be identified per trap per location?
- What method of analysis will be used to identify WNV and EEE?
- When trapped mosquitoes are positive for WNV or EEE will an assessment be made of the flight range to humans/settlements?

Taken altogether, such procedures and resultant data can provide a robust arbovirus surveillance program. From this data, the most economical and least harmful to humans and environment IPM prevention and abatement strategies can be designed to adequately manage mosquito populations. The current intentions of the Pioneer Valley

Mosquito Control District do include some of the elements above. But, as we learned on May10, 2021 in a discussion with PVMCD Commissioners, only 2 traps are allocated to each community; and I do not know the duration of each trap's exposure. Although the PVCMD is working hard to protect our communities, they have limited resources. For example, 2 traps per community does not a surveillance program make. I suggest that the State budget for aerial/truck spraying in the Pioneer Valley be re-allocated for non-toxic mosquito IPM – at least in this area. IPM is far more progressive and sustainable, and lacks the irreparable harm to people and the planet done by spraying of synthetic pesticides. On May 10, 2021, Commissioners spoke of their preference not to spray or allow spraying in the Pioneer Valley.

Aerial and truck spraying are ineffective in the long term. To read about the ineffectiveness of spraying and its harm to people, other non-target species and the environment, go to: https://www.beyondpesticides.org/assets/media/documents/mosquito/documents/IneffectivenessofPesticides_Fitz.pdf. This is from 2003, but clarifies many of the issues, including: lack of long-term effects; habits of mosquitoes vs. aircraft flight patterns and routes navigable by spray trucks; rapid developing resistance to synthetic pyrethroids; etc. Reported "effectiveness" of spraying by the State does not include when, where and for how long pre- and post-spraying the samples were collected (2020 Arbovirus Surveillance and Response Plan) . Post-spraying samples often show reductions, but only for several days, after which the mosquito population rebounds in the area sprayed; hence, reductions are not sustainable. Widespread spraying represents backward thinking; how can one justify doing something that harms people and the environment, may enhance the mosquito population, while not significantly impacting the disease problem at hand? Regardless of all other factors (mosquito vector species, rainfall, winter weather, etc.), more permanent *population reductions* are gained by well-timed, thorough, community-wide habitat reduction interventions. Early season efforts are often coupled with measures that target larvae in important breeding sites. Preventive efforts in pre-season and in late season (piggy-backed with a hard frost when mosquito populations are vulnerable) can both be valuable.

In much of the following discussion, I have used Hampshire County/Northampton and South Hadley as examples. The 2020 maps of MA Historical Data for WNV and EEE Positive Samples show no positive WNV or EEE mosquitoes were found in Hampshire County, including Northampton & South Hadley. That was apparently true for *Culiseta melanura* and other bird-biting mosquitoes, *Coquillettidia perturbans* and other mammal-biting mosquitoes, and no positive mammals (non-wildlife, non-human) were found. However, of 97 WNV mosquito samples statewide, 1 mosquito was positive for WNV in contiguous Hampden County/Holyoke (09/03/2020), a *Culex pipiens*/resturans complex. For the whole state there were 8 human positive WNV records, none in Hampshire or any contiguous counties. For EEE, of 66 mosquito samples statewide, there were 2 positive mosquitoes in contiguous Franklin County; in Orange

(07/01/2010) and Wendell (07/05/2020), both mosquitoes were *Coquillettidia perturbans*. There was 1 human positive case in contiguous Hampden County (08/01/2020) with a clinical presentation of meningoencephalitis. For the entire state there were 5 positive EEE human cases. It appears that mosquito management decisions are being made based on extremely limited (and therefore useless) data that are unlikely to actually reflect events or conditions in the mosquito populations of various communities. The State notes that aerial spraying will be used only in cases of an "elevated risk", but nowhere clearly defines elevated risk. In "IPM speak", this would be referred to as a tolerance limit (injury level or action level), and clarifying conditions would follow.

PVMCD reports do not provide the details of the trapping effort (number of traps, trap distribution, hours, trap success, etc., etc.) as indicated above in my second paragraph. The State is equally remiss in describing its surveillance program (2020 Arbovirus Surveillance and Response Plan) for which many communities totally lack (because they have no MCD). Effort should be equal, or near equal in all cases and under the same conditions (location, weather, etc.); the collected 66 and 97 samples seem highly inadequate for a statewide effort, but perhaps there are more data available elsewhere. These data are necessary to know whether the salient factors have been appropriately evaluated for mosquito management to occur, and what IPM interventions are likely to provide sustained, environmentally sound relief.

Some relevant comments on the mosquito vectors found in or near Northampton and South Hadley, and their habits, are provided below, largely from http://entnemdept.ufl.edu/creatures/aquatic/Coquillettidia_perturbans.htm.

•*Coquillettidia* perturbans larvae do not need to rise to the surface to breathe like other mosquito larvae because they obtain oxygen directly from aquatic plants. Hence, thin films over breeding sites are not relevant for larviciding efforts. Adult males feed exclusively on flower nectars and other plant juices. Females also feed on flower nectar for nutrition, but must also feed on blood for egg production. They have been reported to bite and feed on the blood of a wide variety of wild and domestic birds and mammals, including humans. The female is a capable biter, and able to penetrate clothing; they also are strong fliers and able to travel up to five miles — something that must be considered in a management plan. Because cattails (*Typha* spp.) are the preferred developmental host of *Coquillettidia perturbans*, removal of excessive cattail growth (source/habitat reduction) often is the only effective and economical long-term method of control.

•*Culex pipiens*/resturans complex are common in urban and suburban communities as well as on rural premises; they can tolerate a large range of habitat or ecological conditions. Members of the complex readily breed in storm sewer catch basins, clean and polluted ground pools, ditches, animal waste lagoons and effluent from sewage

treatment plants (http://vectorbio.rutgers.edu/outreach/species/sp1.htm). *Cx. pipiens* readily utilizes and appears to prefer birds as bloodmeal hosts; however, it will feed on mammals including humans when abundant. A 2006 CDC study (https://wwwnc.cdc.gov/eid/article/12/3/05-1004_article) suggests that *Cx. salinarius* is an important bridge vector to humans, while *Cx. pipiens* and *Cx. restuans* are more efficient enzootic vectors in the northeastern United States. Hence the 2020 finding of WNV in a *Culex pipiens*/resturans complex in Hampden County/Holyoke may be less significant to humans than originally thought. After blood-feeding, females may return to the same or nearby larval habitats to oviposit and are often considered nonmigratory mosquitoes (http://vectorbio.rutgers.edu/outreach/species/sp1.htm). However, some females may travel considerable distances from resting sites to search for blood hosts and marked females have been shown to travel up to 1100 m (0.7 mi) in a single night. That said, *Cx. Pipiens/restuans* population abundance is positively correlated with human population density, housing unit density, and urban land use and land cover classes and negatively correlated with age of dwellings and amount of forested land (https://www.liebertpub.com/doi/full/10.1089/vbz.2008.0063). Note that these preferred locations also favor the many bird species desired for bloodmeals by this mosquito.

Lastly, basic educational interventions (teaching people to use mosquito personal protective measures, including the least toxic CDC-approved mosquito repellents, long sleeves and long pants [heavier fabrics resist bites], mosquito netting, avoiding active mosquito times of day); and physical interventions (repairing door and window screens, assuring that doors and windows fit tightly, eliminating mosquito breeding sites, such as: empty bird baths twice per week, clean clogged gutters, get rid of junk bottles & cans that hold water) are among the best public health interventions for both EEE and WNV. Limited treatment of important breeding areas in wetlands and swamps (e.g, with *Bacillus thuringiensis* var. *israelensis*) can also be very useful. Other biological pesticides are also available, e.g., for use in catch basins and abandoned swimming pools. While specific details may differ, these are the interventions that have a very good record of success in reducing mosquito populations; and it is surveillance ('monitoring' in IPM speak) that teaches us when, where and what to apply for IPM interventions.

The lack of a strong presence of WNV and EEE disease-positive mosquitoes in the Northampton/South Hadley area leads me to question why any aerial or truck spraying are being considered. What has changed since 2020 to justify the need to spray Anvil 10+10 (Sumithrin & synergist Piperonyl Butoxide in a petroleum solvent)? Unfortunately, since the State vastly underfunds surveillance, we have almost no meaningful data on which to base a decision.

Because all pesticide products are inherently toxic, no exposure is risk free. The likelihood of experiencing adverse health effects from exposure to any pesticide

depends primarily on the amount of pesticide that a person contacts and the amount of time the person is in contact with that pesticide. In addition, a person's age, sex, genetic makeup, lifestyle and/or general health characteristics can affect his or her likelihood of experiencing adverse health effects as a result of exposure to pesticides, including Anvil. Detailed monitoring of human exposures and any pesticide-relate illness should accompany all spraying programs. The NYS Dept. of Health (https://www.health.ny.gov/publications/2738/) tells us this: "Short-term exposures to very high levels of pyrethroid pesticides similar to Sumithrin can affect the nervous system, causing such effects as loss of coordination, tremors or tingling and numbness in areas of skin contact. Short-term exposure to high levels of petroleum solvents can cause irritation of the eye, skin, nose, throat or lung. Vomiting or central nervous system depression may occur if very high levels of petroleum solvents are ingested. There are no studies examining whether the use of Anvil to control mosquitoes has caused any long-term health effects in humans. Anvil is applied at very low concentrations to control mosquitoes. It is unlikely that adverse health effects will occur as a result of this use for most people, but some individuals may experience health effects. For these reasons, individuals should consider taking steps to minimize their exposure to Anvil if it is applied to control mosquitoes." (https://www.health.ny.gov/publications/2738/). Further, as with any pesticide, steps can be taken to help reduce possible exposures to Anvil before, during, or after spraying.

- Children and pregnant women should take care to avoid exposure.
- If possible, remain inside or avoid the area whenever spraying takes place and for about 30 minutes after spraying. That time period will greatly reduce the likelihood of your breathing airborne pesticide.
- Close windows and doors and turn off window air-conditioning units or close their vents to circulate indoor air before spraying begins. Windows and air-conditioner vents can be reopened about 30 minutes after spraying (assuming one knows when spraying occurred).
- If you come in direct contact with Anvil spray, protect your eyes. If you get Anvil spray in your eyes, immediately rinse them with water. Wash exposed skin. Wash clothes that come in direct contact with spray separately from other laundry.
- Consult your health care provider if you think you are experiencing health effects from spraying.
- If spraying just occurred, minimize your contact with sprayed surfaces and wash skin that has come in contact with these surfaces.
- Pick homegrown fruits and vegetables you expect to eat soon before spraying takes place. Rinse homegrown fruits and vegetables (in fact, all produce) thoroughly with water before cooking or eating.
- Cover outdoor tables and play equipment before spraying or wash them off with detergent and water after they have been sprayed.

- Bring laundry and small toys inside before spraying begins (wash with detergent and water if exposed to Anvil during spraying).
- Bring pet food and water dishes inside and cover ornamental fishponds to avoid direct exposure.

But why bother? Widespread spraying by air or truck devastates biodiversity and is related to many human medical conditions. Following surveillance (or monitoring), integrated pest management calls primarily for: educational interventions (particularly, what people can do to avoid being bitten and how to eliminate breeding sites on private property) and community-scale physical/habitat modification on public (and private) property as the best public health approaches. A robust IPM program would avoid the difficulties and expense of extensive preparation to spray, spraying *per se*, and the even more difficult and extensive preparations for people to protect themselves against the spraying.

There appear to be many inequities in the State's plan to spray – from exposure of those humans who will not be able to medically tolerate inhalation of the Sumithrin, PBO and/or the petroleum solvent (the same applies to the uncounted animals, including endangered species and important mosquito predators that will be exposed), to pollinator species (including domestic bees and hundreds of wild bee species - there is no defense for these), and birds, bats and other wild animals that will be exposed.

Organic gardens and farms are also subject to being sprayed (even if they have opted-out) due to pesticide drift from the air-wash of the aircraft and the wind. And what about surface drinking water supplies and fish hatcheries? A "warning" is insufficient because the PVMCD program (re. many unknowns such as weather) mostly calls for notification *after the fact*. It goes on and on, and not to mention the lack of efficacy of spraying versus local educational interventions and application of physical/habitat modification interventions that would be sustainable and would not include spraying of a synthetic pesticide. Note that Anvil will kill mosquitoes it contacts, but among other issues, mosquitoes frequently rest on the underside of foliage, in dense foliage, in tree holes, under decks and other protective locations that are out of the spray zone that largely topcoats surfaces.

A well-maintained surveillance system will identify a problem early in the season during the larval stage (or earlier) eliminating the need for spraying adulticides (such as Anvil). Note that treating natural bodies of water with *Bacillus thuringiensis* var. *israelensis* can be efficacious, but it must be used cautiously because of its negative effects on non-target species. Habitat modification to eliminate breeding sites should be initiated early in the season when surveillance indicates a developing problem. At this time, the wide range of non-toxic integrated pest management interventions have

certainly not been fully applied. The PVMCD includes some valuable interventions (education and outreach); however, all other IPM public health measures (including community-wide habitat modification) to control mosquitoes have not been exhausted. Opting-out of spraying would be an appropriate action for communities in the Control District; however, monitoring and various non-toxic IPM interventions should be thoroughly implemented. Significant state funding will be needed to initiate these non-toxic measures to protect the people of the Pioneer Valley. To quote William A. McDonough (Architect, Sustainable Development & Design), **"We must not toxify the mass assets (the earth's soil, air, water, and vegetation) that we all need to survive."**

Dr. Stephen C. Frantz
Research Pathobiologist
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To the members of the 21st Century Mosquito Task Force,

I hope you will consider my comments as you develop the state's next policy on mosquito management.

I have to say that I am just appalled and deeply disturbed by the prospect of indiscriminate pesticide spraying in the town of Northfield, or anywhere else in our rural, sparsely populated, richly biodiverse Massachusetts communities.

How is it possible that widespread, prophylactic spraying of pesticides has suddenly become the default policy for every town in the state, leaving our volunteer town elected officials scrambling to opt out before the arbitrary and unreasonable deadline expires? And this on top of COVID-19!

Blanket spraying of toxic pesticides like Anvil 10+10 will not make us any safer, but it will certainly result in catastrophic harm to fish and other aquatic life, and to bees and all the other precious pollinating insects which are so beneficial to our Commonwealth. Not to mention our declining populations of birds which depend upon an abundant supply of caterpillars if they are to successfully raise a clutch of nestlings to fledging.

There are other states where a significant majority of voters favor the denial of science, but fortunately our state is not one of them. Our state is among the most well educated in our country, and its many colleges and universities among the very best. There really is no excuse, therefor, for such a misguided policy. If anyone should know better surely it is our state. Massachusetts should be playing a leadership role in demonstrating best environmental practices, not reverting to the practices of 50-60 years ago.

Have we really not yet learned that clean water, pure air and unspoiled habitat supporting a rich and thriving biodiversity are our greatest assets? Our quality of life is directly related to these things and we must give priority to protecting them.

In the event of a genuine public health emergency, one can see localized spraying playing an important role, but the harm that indiscriminate pesticide spraying causes far outweighs the gains. Knowing what we know today, and faced with the unprecedented challenges of global climate change, doing such misguided harm is unacceptable.

I support the recommendations of the MassQuito Coalition and ask that you make their recommendations part of the new policy.

Thank you,

John Schuster
29 Pratt Hollow Rd.
Northfield, MA 01360

To the members of the 21st Century Mosquito Task Force,

Thank you for the opportunity to comment on the state's mosquito management policy for the 21st Century Mosquito Task Force. I am deeply concerned about the protection of public health and the environment in the state's approach to mosquito management. The use of toxic pesticides in our communities indiscriminately applied on farms, forests, fields and homes throughout the commonwealth, is deeply concerning, and short sighted at best. At a critical time when climate change and habitat degradation are causing catastrophic decline in pollinating insects and bird species, the use of Anvil 10+10 is unacceptable.

The two active ingredients in this product are sumithrin and PBO. EPA classifies PBO is a "possible human carcinogen." Sumithrin is known to suppress the immune system and interferes with respiratory function. The state Department of Marine Fisheries has documented serious adverse effects from aerial spraying of Anvil 10+10, which is "very highly toxic to fish and aquatic invertebrates" as "runoff from treated areas or deposition into bodies of water are hazardous to fish and aquatic invertebrates." Likewise, the Department of Fish and Wildlife has expressed concerns about the negative impact on a variety of native insects and state listed species, and the Department of Environmental Protection pointed out this product is "highly to very highly acutely toxic to fish, aquatic invertebrates and honeybees."
To protect health and the environment, adulticides should never be sprayed 'on demand,' based on nuisance mosquito populations. Aerial spraying is ineffective, places public health at unnecessary risk, and should not be part of a mosquito control program going forward. Last year, state records documented the ineffectiveness of aerial spraying as a tactic to combat mosquito-borne diseases, according to a complaint filed by Public Employees for Environmental Responsibility (PEER) with the Commonwealth Office of Inspector General. Data from the 2019 applications revealed half the spray events had a 0% efficacy (i.e., no reduction in primary mosquito vectors) and cost taxpayers $2.2 million.

In the event that pesticides are used under a clear public health emergency, it is critical that the Mosquito Task Force ensures that communities and residents have full disclosure of all pesticide use, including so-called 'inert' ingredients and potential contaminants like PFAS, as well as advance notice of any planned spraying and any opt-out opportunities.

Finally, unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as these same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems. As someone with autoimmune disease and other health issues, I am deeply concerned about the health affects and of these pesticides and do not feel I would be safe in my own home in the event of blanket aerial spraying. I also am extremely concerned about the effect this would have on our water supply, and the aerial use of toxic pesticides in our Water Supply Protection Districts is highly inappropriate.

I support the recommendations of the MassQuito Coalition and ask that you make their recommendations part of the new policy.

Thank you,

Martha Rullman
29 Pratt Hollow Rd.
Northfield, MA 01360

TOWN OF WELLESLEY *MASSACHUSETTS*

NATURAL RESOURCES COMMISSION

Town Hall, 525 Washington Street, Wellesley, Massachusetts 02482-5918

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Brandon Schmitt, Director
Telephone: 781.431.1019, Ext. 2298
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May 21, 2021

RE: Mosquito Control

Dear Members of the 21st Century Mosquito Task Force,

Recognizing the many dangers to human health from pesticides, the Town of Wellesley has managed its town lands under an organic integrated pest management plan since 2002. We conduct extensive public outreach to educate our residents about the benefits of eco-friendly landscaping. Our town annually requests exclusion from the State's Wide Area Applications of Pesticides program. We are currently conducting a community-wide initiative to increase our valuable insect pollinator populations in our town.

We are therefore writing to express our concerns about the widespread use of toxic pesticides to manage mosquitoes, and to ask your Task Force to develop a Mosquito Management Policy that controls mosquito populations using proven, effective ecological methods. We request pesticides only be used as a last resort during a declared public health emergency, and only after all other preventative measures have been exhausted.

In 2019, despite mosquito monitoring which showed no evidence of mosquitoes in Wellesley carrying Eastern equine encephalitis (EEE), parts of Wellesley were nonetheless subjected to broad aerial spraying of the insecticide Anvil 10+10, which contains the synergist ingredient Piperonyl butoxide (PBO), which is listed as a Class C carcinogen, and is highly toxic to especially amphibians, particularly at the tadpole stage. In the days leading up to the spraying, town staff and officials heard from many concerned residents who asked how they could protect their organic vegetable gardens and honey bees, as well as birds and insects like fireflies and dragonflies, from these non-discriminate chemicals. (The irony here is that dragonflies and frogs are natural predators of mosquitoes.) Many residents were upset and angry that they and their children were being subjected to these chemicals - especially with no cases of EEE in Wellesley - and that there was no way to opt-out of the broad-based spraying. Several residents questioned why, if the chemicals were safe, they were being advised by the State to stay inside and close their windows.

After the spraying, it was learned that the product spayed, Anvil 10+10, also contained high levels of per- and polyfluoroalkyl substances (PFAS), "forever chemicals." [1] [2] "PFAS exposure has been associated with changes in liver and kidney function, changes in thyroid hormone and cholesterol levels, and immune system effects. PFOA and PFOS have also been shown to cause developmental effects to fetuses during pregnancy."[3]

Now, two years later, high levels of PFAS chemicals have also been found in our Town's drinking water supply, which has necessitated the Water Department to take one of our water plant facilities offline.[4] The discovery of these high levels of PFAS has disrupted Town operations, raised health concerns among our residents, and will ultimately cost our taxpayers in higher water rates.

Regardless of the source of this PFAS contamination, it is time to stop the use of toxins in our environment, including those used to control mosquitoes. Safer options exist. Wellesley has long been a leader in pesticide reduction, and we ask the State to not undermine our efforts. We ask the 21st Century Mosquito Task force to use the latest scientific knowledge available to develop a science-based, ecological mosquito management policy, which includes the elimination of aerial spraying of pesticides.

On behalf of the Wellesley Natural Resources Commission,

Brandon Schmitt, Director

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[1] Boston Globe December 1, 2020 https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/

[2] EPA: https://www.epa.gov/newsreleases/epa-releases-testing-data-showing-pfas-contamination-fluorinated-containers

[3] Mass.Gov https://www.mass.gov/service-details/per-and-polyfluoroalkyl-substances-pfas-in-drinking-water

[4] https://wellesleyma.gov/DocumentCenter/View/24320/PFAS-news-release_FINAL562021

THOUGHTS ON THE PVMCD MOSQUITO MANAGEMENT PLAN – 05/10/2021

Dr. Stephen Frantz, Research Pathobiologist

I am Dr. Stephen Frantz, Research Pathobiologist with Global Environmental Options, South Hadley (formerly: Dept. of Pathobiology, The Johns Hopkins University, Bloomberg School of Public Health; and Dept. of Environmental Health and Toxicology, School of Public Health, State University of New York). I am also on the Northeast Organic Farming Association/MA (NOFA/MA) Policy Committee and a member of Climate Action Now's Regenerative Farming, Forests and Food Systems Working Group.

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What sort of data are necessary to satisfy an informed public and the scientific community? It starts with surveillance; a detailed, complicated system, the key elements of which should include:

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Taken all together, such procedures and resultant data can provide a robust arbovirus surveillance program from which prevention and IPM abatement strategies can be designed that are least harmful to people and the environment, are economical, while at the same time adequately managing mosquitoes. The current intentions of the Pioneer Valley Mosquito Control District include only some of the elements above. As we learned today (May 10, 2021) in the discussion with PVMCD Commissioners, only 2 traps are allocated to each community; and I do not know the duration of each trap's exposure. Although the PVMCD is working hard to protect our communities, they have limited resources. For example, they are only able to set 2 traps per community, which does not a surveillance program make. I suggest that the State budget for aerial/truck spraying in the Pioneer Valley be re-allocated for non-toxic mosquito IPM -- for at least this Valley. IPM is far more progressive and sustainable, and lacks the harm to people and the planet done by spraying of synthetic pesticides. Commissioners spoke today of their desire to not spray or to not allow spraying in the Pioneer Valley.

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1 human positive case in adjacent Hampden County (08/01/2020) that resulted in a diagnosis of meningoencephalitis. For the entire state there were 5 positive cases of human EEE. With such data in mind, mosquito management decisions are being made based on extremely limited data that do not reflect events or conditions in the mosquito populations of various communities; the data are nearly useless. The State notes that aerial spraying will be used in cases of an "elevated risk", but nowhere defines elevated risk. In "IPM speak", this would be referred to as a tolerance limit (injury level or action level), and clarifying conditions would follow.

In the reports by the PVMCD, we are not provided with the details of the trapping effort (locations, hours, trap success, etc., etc.) as indicated above in my second paragraph. Effort should be equal, or near equal in all cases and under the same conditions (location, weather, etc.); 66 and 97 samples seem very light for a statewide effort, but perhaps there are more data available elsewhere. These data are necessary to know whether the salient factors have been appropriately evaluated for mosquito management to occur, and what IPM interventions are likely to provide sustained, environmentally sound relief. Some relevant comments on the mosquitoes found in or near Northampton, and their habits, are provided below, largely from http://entnemdept.ufl.edu/creatures/aquatic/Coquillettidia_perturbans.htm.

•*Coquillettidia perturbans* larvae do not need to rise to the surface to breathe like other mosquito larvae because they obtain oxygen directly from aquatic plants. Adult males feed exclusively on flower nectars and other plant juices. Females also feed on flower nectar for nutrition, but must also feed on blood that is essential for egg production. They have been reported to bite and feed on the blood of a wide variety of wild and domestic birds and mammals, including humans. The female is a vicious biter, capable of penetrating clothing; they also are strong fliers and able to travel up to five miles — something to consider in a management plan. Because Cattails (*Typha* spp.) are the preferred developmental host of *Coquillettidia perturbans*, removal of excessive cattail growth (source/habitat modification) often is the only effective and economical long-term method of control.

Culex pipiens/resturans complex are common in urban and suburban communities as well as on rural premises; they can tolerate a large range of habitat or ecological conditions. Members of the complex readily breed in storm sewer catch basins, clean and polluted ground pools, ditches, animal waste lagoons and effluent from sewage treatment plants (http://vectorbio.rutgers.edu/outreach/species/sp1.htm). *Cx. pipiens* readily utilizes birds as bloodmeal hosts; however, it will feed on mammals including humans when abundant. *Culex pipiens* appears to display a stronger preference for birds. A 2006 CDC study (https://wwwnc.cdc.gov/eid/article/12/3/05-1004_article) suggests that *Cx. salinarius* is an important bridge vector to humans, while *Cx. pipiens* and *Cx. restuans* are more efficient enzootic vectors in the northeastern United States. Hence the 2020 finding of WNV in a *Culex pipiens*/resturans complex in Hampden County/Holyoke may be less significant to humans than originally thought. After bloodfeeding, females may return to the same or nearby larval habitats to oviposit and are often considered nonmigratory mosquitoes (http://vectorbio.rutgers.edu/outreach/species/sp1.htm). However, some females may travel considerable distances from resting sites to search for blood hosts and marked females have been shown to travel up to 1100 m (0.7 mi) in a single night. That said, *Cx. pipiens–restuans* population abundance is positively correlated with human population density, housing unit density, and urban land use and land cover classes and negatively correlated with age of dwellings and amount of forested land (https://www.liebertpub.com/doi/full/10.1089/vbz.2008.0063). Note that these preferred locations also favor many bird species desired for bloodmeals by this mosquito.

Lastly, basic educational interventions (teaching people to use personal protective measures, including mosquito repellents, long sleeves and long pants, mosquito netting, avoiding active mosquito times of day); and physical intervention (repairing screens, eliminating mosquito breeding sites) are among the best public health interventions that can be taken.

The lack of a strong presence of WNV and EEE disease-positive mosquitoes in the Northampton area leads me to question why any aerial or truck spraying are being considered. What has changed since 2020 to justify the need to spray Anvil 10+10 (Sumithrin & enhancer Piperonyl

Butoxide in a petroleum solvent)? Unfortunately, since the State vastly underfunds surveillance, we have no meaningful data on which to base a decision.

Because all pesticide products are inherently toxic, no exposure is risk free. The likelihood of experiencing adverse health effects from exposure to any pesticide depends primarily on the amount of pesticide that a person contacts and the amount of time the person is in contact with that pesticide. In addition, a person's age, sex, genetic makeup, lifestyle and/or general health characteristics can affect his or her likelihood of experiencing adverse health effects as a result of exposure to pesticides, including Anvil. The NYS Dept. of Health (https://www.health.ny.gov/publications/2738/) tells us this: "Short-term exposures to very high levels of pyrethroid pesticides similar to Sumithrin can affect the nervous system, causing such effects as loss of coordination, tremors or tingling and numbness in areas of skin contact. Short-term exposure to high levels of petroleum solvents can cause irritation of the eye, skin, nose, throat or lung. Vomiting or central nervous system depression may occur if very high levels of petroleum solvents are ingested. There are no studies examining whether the use of Anvil to control mosquitoes has caused any long-term health effects in humans. Anvil is applied at very low concentrations to control mosquitoes. It is unlikely that adverse health effects will occur as a result of this use for most people, but some individuals may experience health effects. For these reasons, individuals should consider taking steps to minimize their exposure to Anvil if it is applied to control mosquitoes." (https://www.health.ny.gov/publications/2738/). Further, as with any pesticide, steps can be taken to help reduce possible exposures to Anvil before, during, or after spraying.

- Children and pregnant women should take care to avoid exposure.
- If possible, remain inside or avoid the area whenever spraying takes place and for about 30 minutes after spraying. That time period will greatly reduce the likelihood of your breathing airborne pesticide.
- Close windows and doors and turn off window air-conditioning units or close their vents to circulate indoor air before spraying begins. Windows and air-conditioner vents can be reopened about 30

minutes after spraying (assuming one knows when spraying occurred).

- If you come in direct contact with Anvil spray, protect your eyes. If you get Anvil spray in your eyes, immediately rinse them with water. Wash exposed skin. Wash clothes that come in direct contact with spray separately from other laundry.
- Consult your health care provider if you think you are experiencing health effects from spraying.
- If spraying just occurred, minimize your contact with sprayed surfaces and wash skin that has come in contact with these surfaces.
- Pick homegrown fruits and vegetables you expect to eat soon before spraying takes place. Rinse homegrown fruits and vegetables (in fact, all produce) thoroughly with water before cooking or eating.
- Cover outdoor tables and play equipment before spraying or wash them off with detergent and water after they have been sprayed.
- Bring laundry and small toys inside before spraying begins (wash with detergent and water if exposed to Anvil during spraying).
- Bring pet food and water dishes inside and cover ornamental fishponds to avoid direct exposure.

But why bother? Integrated pest management calls primarily for educational interventions (particularly, what people can do to avoid being bitten and how to eliminate breeding sites on their property) and community-scale physical/habitat modification as the best public health approaches. A robust IPM program would avoid the difficulties and expense of extensive preparation to spray, spraying *per se*, and the even more difficult and extensive preparations for people to protect themselves against the spraying.

There appear to be many inequities in the PVMCD potential plan to spray, or allowing the State to spray — from exposure of those humans who will not be able to medically tolerate inhalation of the Sumithrin, PBO and/or the petroleum solvent (the same applies to the uncounted animals, including endangered species and mosquito predators that will be exposed), to pollinator species (including domestic bees and hundreds of wild bee species - there is no defense for these), and birds, bats and other wild animals that will be exposed.

Organic gardens and farms are also subject to being sprayed, intentionally due to lack of opting out or unintentionally due to drift from the air-wash of the aircraft and the wind. And what about surface drinking water supplies and fish hatcheries? A "warning" is insufficient because the PVMCD program (re. many unknowns such as weather) mostly calls for notification *after the fact*. It goes on and on, and not to mention the lack of efficacy of spraying versus local educational interventions and application of physical/habitat interventions that would not include spraying of a synthetic pesticide. Note that Anvil will kill mosquitoes it contacts, but mosquitoes frequently rest on the underside of foliage, in tree holes, under decks and other protective locations that are out of the spray zone that largely topcoats surfaces.

A well-maintained surveillance system would identify a problem during the larval stage eliminating the need for spraying adulticides (such as Anvil). At this time, integrated pest management has certainly not been fully applied; the PVMCD includes some valuable interventions (education and outreach); however, all other IPM public health measures (including community-wide habitat modification) to control mosquitoes have not been exhausted. Opting-out of spraying would be an appropriate action for communities in the Control District; however, surveillance and non-toxic IPM interventions should be thoroughly implemented. Significant State funding will be needed for these non-toxic measures to be initiated to protect the people of the Pioneer Valley. Quoting William A. McDonough (Architect, Sustainable Development & Design), "We must not toxify the mass assets (the earth's soil, air, water, and vegetation) that we all need to survive."

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 6, 2021 12:04 pm
Browser:	Safari 14.0 / OS X
IP Address:	71.192.37.105
Unique ID:	805064727
Location:	

Name	Mary Alice Wilson
Subject:	spraying for mosquitoes
Comments:	Aerial spraying does kills a few mosquitoes and many other insects the pollinate our food. Why on earth would anyone want to do that? There are more effective ways to help citizens avoid high-risk mosquito bites. Breathing the air should not be hazardous.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 7, 2021 5:33 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	73.167.238.24
Unique ID:	805390510
Location:	

Subject:	Mosquito Spraying
Comments:	Hello, I would love to see Northampton adopt an alternative to mosquito control. There are many ways we could deal with mosquitoes versus spraying damaging pesticides over the city of Northampton and putting more distress on the habitat in the city, where communities that are highly populated gather and grow their own food. Spraying also has an inordinate impact in communities that are low income. Given that many grow their own food organically where they must live, it is unfair to spray where there are areas of food insecurity. People who do not own their own homes but should have a right to say no to toxic pesticides that most frequently get sprayed in busy areas of the city. Another alternative would be to be sure state and federal properties are up to par with maintenance of gutters and water distribution from roofs and parking lots. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 6, 2021 12:10 am
Browser:	Chrome 89.0.4389.128 / Windows
IP Address:	70.105.254.36
Unique ID:	804638202

Name	John Schuster
Organization / Affiliation:	Resident of Northfield
Subject:	NO to indiscriminate spraying of pesticides in our Commonwealth
Comments:	Please find my attached comment letter in pdf format
File	https://massgov.formstack.com/admin/download/file/10553788414

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 20, 2021 8:56 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	161.129.248.132
Unique ID:	812263414

Name	Stephen Frantz
Organization / Affiliation:	Global Environmental Options, LLC
Subject:	Mosquito Management V.II
Comments:	This is my second version of "Comments" that I think was needed to help everyone understand the issues. I do hope this helps to clarify many of the issues of concern to many people in the Commonwealth. Basically, spraying from airplanes or trucks is anathema to managing populations of mosquitoes for public health. The reasons for this are provided herein. Thank you.
File	https://massgov.formstack.com/admin/download/file/10651236646

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 6, 2021 9:07 am
Browser:	Chrome 90.0.4430.93 / OS X
IP Address:	73.114.212.107
Unique ID:	804963864
Location:	

Name	Abby Ytzen-Handel
Subject:	Please do not spray on this scale, it is very destructive for our pollinators, which is critical to our food supply / security
Comments:	To whom it may concern, We are a small scale organic homestead / farm / plant nursery, we keep honey bees and help encourage a diverse and healthy insect population as well as bats. This sort of spray is not only damaging to people, but especially damaging to honey bees and other native bees / pollinators and the bat population (which eat and control mosquito population). Please reconsider any wide spread spraying of chemicals, the over all and long term risk to the health of our ecosystems needs to be consider as a serious cost to this treatment. Thank you for taking time to read this. Cheers, Abby

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 25, 2021 12:02 pm
Browser:	Firefox 88.0 / Windows
IP Address:	68.163.101.27
Unique ID:	814080614

Organization / Affiliation:	Town of Wellesley, Natural Resources Commission
Subject:	Letter to the 21st Century Mosquito Control Task Force
Comments:	Please find attached the letter from the Town of Wellesley's Natural Resources Commission regarding mosquito control, especially spraying for mosquitos.
File	https://massgov.formstack.com/admin/download/file/10673148161

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 12, 2021 3:44 pm
Browser:	Safari 12.1.2 / OS X
IP Address:	146.115.147.37
Unique ID:	807632216
Location:	

Name	Brita Lundberg
Organization / Affiliation:	Greater Boston Physicians for Social Responsibility
Subject:	Pesticide spraying in MA

Comments:

Dear Members of the 21st Century Mosquito Task Force,

As a resident of Massachusetts and Chair of the Board at Greater Boston Physicians for Social Responsibility, I am deeply concerned about the use of toxic pesticides to manage mosquitoes, and urge this Task Force to develop a science-based, ecological mosquito management policy to submit to lawmakers next year.

Ecological mosquito management prioritizes preventative measures, and includes:

Monitoring and surveillance
A strong focus on public education and personal protective measures
Emphasis on eliminating breeding sites
Consideration of local ecology
A tiered approach to management:
Non-toxic approaches, such as habitat manipulation must be attempted first
Larvaciding should be conducted based on monitoring for predefined thresholds
Adulticiding (spraying for adult mosquitoes) should be permitted only during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective
Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underline the need for an approach that does not place these products at the top of the toolbox.

To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

In the event that pesticides are used under a clear public health emergency, it is critical that the 21stCentury Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities.

Business as usual cannot continue. Unrestricted spraying of toxic

pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which Covid-19 attacks.

I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country - residents like myself will be watching closely to ensure this opportunity is not missed.

Yours sincerely,

Brita E. Lundberg, M.D.
Chair of the Board
Greater Boston Physicians for Social Responsibility

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 13, 2021 12:21 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	65.132.103.76
Unique ID:	808309556
Location:	

Name	Robert Clark
Organization / Affiliation:	Petersham Open Space & Recreation Committee and Conservation Commission
Subject:	Mosquito Control
Comments:	I wish to opt out of mosquito control on all protected land in the Town of Petersham as mosquito control would likely threaten the many endangered in our town.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 24, 2021 12:55 pm
Browser:	Firefox 88.0 / Windows
IP Address:	71.233.112.226
Unique ID:	813555582
Location:	

Name	Ellen Moyer, PhD, PE
Organization / Affiliation:	Greenvironment, LLC
Subject:	Plans to spray for mosquitos

Comments:

As a registered professional engineer with an MS and PhD in environmental engineering, I have spent decades cleaning up contaminated soil and groundwater - contamination created by decisions made in the past based on ignorance and carelessness. We need to start behaving intelligently!

I wrote in my award-winning third book, Our Earth, Our Species, Our Selves: How to Thrive While Creating a Sustainable World, about how DDT trucks used to roll through the streets in Wayland, spewing their poison to kill mosquitoes, while my mother kept us kids inside, as much as we longed to run through the spray. This was 60 years ago. I assumed we had learned better in all that time since. When I learned of plans to carpet bomb for mosquitoes again now, I couldn't believe it.

Recent science shows that spraying mosquitoes with synthetic chemicals doesn't work very well. One reason is that insects become resistant (https://www.sciencemag.org/news/2016/10/after-40-years-most-important-weapon-against-mosquitoes-may-be-failing). However, the spraying negatively impacts virtually everything it contacts. Biocides (pesticides, herbicides, fungicides, and other "cides") are a key reason for these devastating developments:
• Insects - are declining by 11% per decade
https://science.sciencemag.org/content/370/6515/eabf1915
• Birds - one in four has vanished in the last 50 years
https://www.allaboutbirds.org/news/vanishing-1-in-4-birds-gone/
• Soil microbial diversity - is plummeting
https://www.agriculture.com/crops/soil-health/soil-health-means-better-human-health
• Human microbial diversity (most microbes are in our guts) - is plummeting too, at about the same rate as soil microbes
https://www.agriculture.com/crops/soil-health/soil-health-means-better-human-health

This information is new, and it needs to drive behavior change. We can't just continue business-as-usual spewing forth poisons willy-nilly, knowing what we now know!

Furthermore, EPA's pesticide approval process is incomplete. It doesn't consider impacts on soil organisms, it may not include all ingredients (such as "inert" ones, many of which are nasty) in a pesticide product, and it does not include synergistic effects with other contaminants that we're also subjected to.

Carpet bombing synthetic biocides contaminates everything. Just consider your lawn. People, including kids, and pets and wildlife can directly contact the poisons. People and pets track poisons into the home when they come inside. Baby crawls around on the floor, directly contacting the poison, then puts his/her hand in his/her mouth, ingesting the poison. This is insane, at best.

Indiscriminate spraying of biocides is a barbaric practice that has to end and be replaced by intelligent plans to stop breeding mosquitos (e.g., in old tires lying around) and coming into contact with them (by using repellents and long clothing to avoid bites, and maybe even staying inside during peak feeding times). If synthetic biocides are used at all, they should be used on an opt-in rather than opt-out basis, and with informed consent of the public (i.e., informed of ALL pesticide ingredients and ALL their human and environmental health risks).

I live in a small town, Montgomery (population ~800). To expect a small town like this to do the hoop-jumping required to opt out is unrealistic and unfairly burdensome.

Please withdraw this reprehensible plan that would inflict widespread harm on the biosphere.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 10:12 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	70.105.254.36
Unique ID:	804613552
Location:	

Name	Martha Rullman
Organization / Affiliation:	Resident and retired biologist
Subject:	Comments for Mosquito Control Task Force

Comments:

Thank you for the opportunity to comment on the state's mosquito management policy for the 21st Century Mosquito Task Force. I am deeply concerned about the protection of public health and the environment in the state's approach to mosquito management. The use of toxic pesticides in our communities indiscriminately applied on farms, forests, fields and homes thoughout the commonwealth, is deeply concerning, and short sighted at best. At a critical time when climate change and habitiat degradation are causing catastrophic decline in pollinating insects and bird species, the use of Anvil 10+10 is unacceptable.

The two active ingredients in this product are sumithrin and PBO. EPA classifies PBO is a "possible human carcinogen." Sumithrin is known to suppress the immune system and interferes with respiratory function. The state Department of Marine Fisheries has documented serious adverse effects from aerial spraying of Anvil 10+10, which is "very highly toxic to fish and aquatic invertebrates" as "runoff from treated areas or deposition into bodies of water are hazardous to fish and aquatic invertebrates." Likewise, the Department of FIsh and WIldlife has expressed concerns about the negative impact on a variety of native insects and state listed species, and the Department of Environmental Protection pointed out this product is "highly to very highly acutely toxic to fish, aquatic invertebrates and honeybees."

To protect health and the environment, adulticides should never be sprayed 'on demand,' based on nuisance mosquito populations. Aerial spraying is ineffective, places public health at unnecessary risk, and should not be part of a mosquito control program going forward. Last year, state records documented the ineffectiveness of aerial spraying as a tactic to combat mosquito-borne diseases, according to a complaint filed by Public Employees for Environmental Responsibility (PEER) with the Commonwealth Office of Inspector General. Data from the 2019 applications revealed half the spray events had a 0% efficacy (i.e., no reduction in primary mosquito vectors) and cost taxpayers $2.2 million.

In the event that pesticides are used under a clear public health emergency, it is critical that the Mosquito Task Force ensures that communities and residents have full disclosure of all pesticide use, including so-called 'inert' ingredients and potential contaminants like PFAS, as well as advance notice of any planned spraying and any opt-out opportunities.

FInally, unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as these same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems. As someone with autoimmune disease and other health issues, I am deeply concerned about the health affects and of these pesticides and do not feel I would be safe in my own home in the event of blanket aerial spraying. I also am extremely concerned about the effect this would have on our water supply, and the aerial use of toxic pesticides

in our water protection disticts is highly inappropriate.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 6, 2021 7:41 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	67.246.12.192
Unique ID:	804895999

Name	Christopher Horton
Organization / Affiliation:	Berkshire County MCP
Subject:	Integrated Mosquito Management
Comments:	https://www.epa.gov/pesticide-registration/about-pesticide-registration https://www.epa.gov/mosquitocontrol/joint-statement-mosquito-control-united-states#:~:text=EPA%20ensures%20that%20state%20and,water%20that%20provide%20breeding%20sites. https://www.cdc.gov/westnile/resources/pdfs/wnvguidelines.pdf
File	https://massgov.formstack.com/admin/download/file/10556185956

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 25, 2021 9:12 pm
Browser:	Mobile Safari 14.0.3 / iOS
IP Address:	72.228.0.204
Unique ID:	814325552
Location:	

Name	Henry Rose
Organization / Affiliation:	Member, Dalton Conservation
Subject:	Aerial Spraying for mosquito control
Comments:	I am opposed to aerial mosquito spraying and I hope you have no plan to do this in Western Mass. I am a physician and a member of my town's conservation commission and I think the risk of spraying outweighs the benefits. The risk of mosquito transmitted disease is low here, spraying with adulticide is harmful to bees and other wildlife, and the dispersal agents themselves can be toxic to humans, which may include PFAS.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 24, 2021 2:54 pm
Browser:	Chrome 90.0.4430.212 / Windows
IP Address:	72.79.237.125
Unique ID:	813615889
Location:	

Name	Pamela Snow
Subject:	Deep concern about detrimental impacts of mosquito spraying
Comments:	I recently learned that Massachusetts is launching a massive statewide aerial spraying of insecticide to kill mosquitos, because some might carry equine encephalitis and west nile virus. This is another short-sighted quick fix that has long-range dangerous consequences to our personal public and planetary health. It will potentially be implemented in every town unless they each opt out. Mosquito Control Pesticides Are Toxic Synthetic Chemicals, not adequately tested by the EPA or MA agencies, that kill pollinators, run off into waterways, do not break down in the environment, add to ecosystem degradation and risk public health. Furthermore, it could ultimately backfire, because it may kill off or injure animals that prey on mosquitoes: https://www.nationalgeographic.com/environment/article/how-pesticides-actually-increase-mosquito-numbers#:~:text=The%20blood%20suckers%20evolve%20resistance,new%20study%20in%20Costa%20Rica.&text=Insecticides%20in%20at%20least%20one,by%20killing%20off%20their%20predators There are more effective, transparent, common sense, ecologically responsible and science-based methods to manage mosquito borne diseases that can replace the state's outdated, expensive mosquito management system. If you have any influence over this matter, I urge you to help stop the plan to conduct aerial spraying. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 10:39 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	70.105.254.36
Unique ID:	804620077

Name	Martha Rullman
Organization / Affiliation:	Resident of Northfield and retired biologist
Subject:	Comments for the Mosquito Control Task Force
Comments:	Please refer to my comment letter attached
File	https://massgov.formstack.com/admin/download/file/10553540219

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 13, 2021 7:23 pm
Browser:	Chrome 90.0.4430.212 / Windows
IP Address:	108.20.198.243
Unique ID:	808496836
Location:	

Name	Regina LaRocque
Organization / Affiliation:	Division of Infectious Diseases, Massachusetts General Hospital
Subject:	pesticide application

Comments:

Dear Members of the 21st Century Mosquito Task Force,

As a resident of Massachusetts and a practicing infectious disease physician-researcher, I am deeply concerned about the use of toxic pesticides to manage mosquitoes, and I urge this Task Force to develop a science-based, ecological mosquito management policy to submit to lawmakers next year.

Ecological mosquito management prioritizes preventative measures, and includes (1) monitoring and surveillance; (2) a strong focus on public education and personal protective measures; (3) emphasis on eliminating breeding sites; (4) consideration of local ecology; and (5) a tiered approach to management:

Non-toxic approaches, such as habitat manipulation, must be attempted first, and larviciding should be conducted only based on monitoring for predefined thresholds.

Spraying for adult mosquitoes should only be permitted during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and when all other, less toxic methods have been attempted and found ineffective.

Furthermore, application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underline the need for an approach that does not place these products at the top of the toolbox.

To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities.

Business as usual cannot continue. Unrestricted spraying of toxic

pesticides raises serious health concerns.

I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country - residents like myself will be watching closely to ensure this opportunity is not missed.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 7, 2021 8:24 am
Browser:	Mobile Safari 14.0.1 / iOS
IP Address:	75.134.74.58
Unique ID:	805447050
Location:	

Name	Jennifer Roda
Subject:	Belchertown farming community
Comments:	I am very against the use of aerial spraying of chemicals to control mosquitoes in my farming town. I don't condone it's use in our state, but especially in towns that grow food. This also seems to go against the rights of those who choose to grow organically. Even if they opt out they still deal with potential overspray. Also using a broad spectrum chemical that kills many other insects that naturally control mosquitoes seems very counterproductive.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 6, 2021 3:38 pm
Browser:	Chrome 89.0.4389.128 / Windows
IP Address:	73.114.145.76
Unique ID:	805168837
Location:	

Name	Samantha Woods
Organization / Affiliation:	North and South Rivers Watershed Association
Subject:	Mosquito Spraying
Comments:	The whole system needs to be reformed. There should be a shift away from frequent spraying and more emphasis on public education for personal protection, and on restoring wetlands and streams for biodiversity including mosquito predators like fish. Municipalities should be able to get help with mosquito testing and public education without having to also accept and pay for routine pesticide spraying. Now they can't. If the town is in a district they can't control or limit the spraying. If they are not in a district, they cant get mosquitoes tested.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 10, 2021 8:39 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	161.129.248.132
Unique ID:	806712393

Name	Stephen Frantz
Organization / Affiliation:	Global Environmental Options, LLC
Subject:	Pioneer Valley Mosquito Control District
Comments:	These comments, in the file attachment, were part of my presentation to the PVMCD Commissioners today (05/10/2021). Thank you for taking them under consideration.
File	https://massgov.formstack.com/admin/download/file/10579737435

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 10:11 pm
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	209.6.216.200
Unique ID:	804613311
Location:	

Name	Katherine Wheeler
Subject:	NO TOXIC SPRAYING
Comments:	Please-- The idea of spraying toxic pesticides is disastrous and unsafe. There are too many toxins in the environment, killing beneficial insects and bio-accumulating poison in human bodies. Support (SD.1202/HD.2383)! Kate Wheeler

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 10, 2021 1:47 pm
Browser:	Chrome 89.0.4389.90 / OS X
IP Address:	73.253.111.81
Unique ID:	806543983
Location:	

Name	Ellen Anthony
Subject:	mosquito spraying
Comments:	Please don't spray Massachusetts with insecticides to kill mosquitoes. 1. The chemical will probably kill other insects also. 2. Some mosquitoes will be resistant, so that you end up breeding for hardier mosquitoes that then can't be killed. 3. The runoff will go down into the aquifers, affecting everyone who drinks water. 4. The spray will land on food crops, making them probably unsafe for people and other animals to eat. 5. There are too many side-effects to a blanket-control non-plan like this. Instead, you can: 1. Make targeted applications in problem areas. 2. Continue with public education about stagnant water. 3. Educate about mosquito repellant. And besides: 1. How many mosquito bites happen each year vs. how many people get sick from those bites??? Thanks for your consoderation, Ellen Anthony Stow

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 12, 2021 9:52 pm
Browser:	Firefox 88.0 / Windows
IP Address:	73.249.70.160
Unique ID:	807776126
Location:	

Name	Patricia Urban
Subject:	Mosquito Spraying Think Twice
Comments:	Please reconsider alternatives for mosquito spraying. There are already companies in MA. spraying personal properties who want to keep mosquitos out of their yard. There are reports stating that the chemicals used for the aerial spraying contain PFAs that are toxic to humans and are linked to cancer and immune diseases. People can protect themselves by wearing long sleeves and using products that contain citronella and natural oils. Please consider the proposed legislation filed by Rep. Tami Gouveia, Sen. Adam Hinds.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 13, 2021 7:01 pm
Browser:	Chrome 90.0.4430.212 / OS X
IP Address:	24.63.26.145
Unique ID:	808489859
Location:	

Name Sydney Engel

Comments:

Dear Members of the 21st Century Mosquito Task Force,

As a family nurse practitioner, primary care provider, and resident of Massachusetts, I am deeply concerned about the use of toxic pesticides to manage mosquitoes, and strongly urge this Task Force to develop a science-based, ecological mosquito management policy to submit to lawmakers next year.

Ecological mosquito management prioritizes preventative measures, and includes:
- Monitoring and surveillance
- A strong focus on public education and personal protective measures
- Emphasis on eliminating breeding sites
- Consideration of local ecology
- A tiered approach to management in which 1) non-toxic approaches, such as habitat manipulation must be attempted first, 2) larvaciding should be conducted based on monitoring for predefined thresholds, and 3) adulticiding (spraying for adult mosquitoes) should be permitted only during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective

Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underline the need for an approach that does not place these products at the top of the toolbox.

To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities.

Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for

mosquitoes are known to elevate risk factors to our immune and respiratory system.

I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC.

We have a chance to be a model for states throughout the country in protecting our citizens from the harmful impacts of excessive pesticide use - residents like myself will be watching closely to ensure this opportunity is not missed.

Please feel free to contact me with any questions.

Sincerely,
Sydney Engel, FNP-BC

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 9:20 pm
Browser:	Mobile Safari 13.1 / iOS
IP Address:	24.63.103.222
Unique ID:	804599666
Location:	

Name	Benjamin Ross
Subject:	Please stop the planned aerial spraying of mosquitos
Comments:	The effects of these chemicals on human health isn't worth the effect it would have on reducing equine encephalitis. There must be a better way. Please cease from putting this plan into effect. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 6, 2021 9:54 am
Browser:	Firefox 88.0 / Windows
IP Address:	75.135.125.62
Unique ID:	804995007
Location:	

Name	Carol Berzonsky
Subject:	Mosquito Insecticide
Comments:	Dear Task Force, I just heard about the plan to perform a statewide aerial spray of insecticide to prevent the proliferation of potentially dangerous disease-carrying mosquitos. While I applaud the protection effort, I'm deeply concerned about creating an equally dangerous problem by the mass spreading of chemicals. My understanding is that Mosquito Control Pesticides Are Toxic Synthetic Chemicals, not adequately tested by the EPA or MA agencies, that kill pollinators, run off into waterways, do not break down in the environment, add to ecosystem degradation and risk public health. There are more effective, transparent, common sense, ecologically responsible and science based methods to manage mosquito borne diseases that can replace the state's outdated, expensive mosquito management system. What have you done to explore these options. Please, do not continue this whack-a-mole idea that using dangerous approaches to prevent dangerous problems makes sense. This is why we're in the planetary predicament we're in right now. Thank you, Worried in Hadley, MA

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 11, 2021 8:14 am
Browser:	Chrome 90.0.4430.93 / Windows
IP Address:	216.193.174.174
Unique ID:	806872282
Location:	

Name	Ed Stockman
Organization / Affiliation:	Summit Farm, Plainfield, MA
Subject:	Mosquito spraying
Comments:	I am a forth generation farmer who lives and farms in Plainfield, Mass. My father's farm in N.Y. State was sprayed for mosquitos in the 1950s. I saw the results of the spraying. Contaminated soil, killed soil life and contaminated humans. That spraying event was the beginning of a silent spring. It stimulated the writing of the book "Silent Spring" by Rachel Carson. Please don't tell me the pesticides used today are safer. We know they are not. They are even more harmful to the environment and human health than the older generation of mosquito control chemicals. In the 65 years since my father's farm was sprayed you'd think mosquito control agencies would have learned how to control mosquitos using more environmental-sound methods. There are environmental-friendly methods available as well you know. The research shows that spraying adulticides is not effective but the state continues to propose spraying. I have to wonder why. Please refer to the recently published report by the Utah Physicians for a Healthy Environment. I don't know of any resource with a more comprehensive assortment of research on the hazards of adulticides. https://www.uphe.org/priority-issues/mosquito-pesticide-spraying/ Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 26, 2021 6:23 pm
Browser:	Safari 14.1 / OS X
IP Address:	216.193.174.174
Unique ID:	814764226
Location:	

Name	Christine Stockman
Organization / Affiliation:	Resident of Town of Plainfield
Subject:	future of spraying for adult mosquitos
Comments:	Please consider banning Anvil 10-10 which has been found to have PFAS in the solution. (After it was sprayed in Massachusetts as per very recent Boston Globe article) Please find out if the company has implemented a change in container use which is suspect to be the source of the PFAS. They have committed to doing that but it needs to be tested and documented. If another less toxic chemical is ever chosen, please also check for PFAS in their solution and from containers. Lastly, please consider larvicide rather than the more toxic adulticide. Chris Stockman

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 5:28 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	96.33.168.213
Unique ID:	804523779
Location:	

Name	Caridad Martinez
Subject:	Mosquito Aerial Spraying
Comments:	I am writing to demand that the State of Massachusetts resist any mass spraying of pesticides to kill and/or control mosquitoes. Blanket spraying of pesticides seems to be one more symptom of a world that promotes financially-motivated "quick fixes", with nature as a resource to be used and abused, without considering long range consequences for generations to come. According to the national Centers of Disease Control and US Environmental Protection Agency, spraying of pesticides to control adult mosquitoes is the least effective, and most environmentally damaging method to control mosquito disease. Many of the ingredients in mosquito pesticides (such as synthetic pyrethroids) have not been tested for health and environmental impacts. One is a known lung irritant (sumithrin) and one is considered to be a possible human carcinogen by the EPA (piperonyl-butoxide). Stop poisoning the LAND and stop poisoning our Children! Caridad Martinez

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 6:35 pm
Browser:	Chrome 90.0.4430.93 / OS X
IP Address:	146.115.144.169
Unique ID:	804548056
Location:	

Name	Ellie Goldberg
Organization / Affiliation:	mothersoutfront, cleanwateraction, greennewton
Subject:	Mosquito Control and Pesticides

Comments:

I am writing to urge the Task Force to consider the serious human and ecological harm that pesticides cause to our families and our communities.

It is unscientific to address mosquito control without also factoring in the direct and indirect effects on
- infants, children, and pregnant women
- people with asthma and other respiratory illnesses, immune suppressed conditions, cancer, COVID, and other acute and chronic conditions that make them highly vulnerable to chemical exposure
- beneficial insects, birds and pollinators
- organic farms and gardens
- surface water and aquatic species
- etc.

Even if it is determined that an entire region or the entire state population is at risk for WNV and EEE because of an increase in infected mosquitoes, there is no threshhold that can reasonably justify triggering the widespread and ineffective aerial application of pesticides.

Every community needs to have the benefits of belonging to mosquito control districts that include services such as monitoring and surveillance, funding for outreach and public education, and funding to modify or eliminate breeding sites without having to also agree to pesticide exposure.

Unless the Task Force has knowledge of all ingredients in a pesticide product and has fully evaluated the toxicity of each ingredient, alone and in combination, it is unethical to consider using the poison. Language that minimizes the danger of pesticides or that exaggerates the benefits of pesticides, or that falsely reassures the public that a product is safe or effective is also unethical. We all know better.

The use of pesticides creates a public health emergency much greater than the extremely rare incidence of EEE and thus the Commonwealth needs to devote the millions of dollars it allocates to mosquito control to education about protective measures and community programs on ecological management. Available opt-out opportunities only give a false sense of security and deceives people into neglecting protective personal measures to avoid the bite.

Thank you for your consideration.

Ellie Goldberg
79 Elmore St
Newton MA 02459

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 6:48 pm
Browser:	Safari 12.1.2 / OS X
IP Address:	162.245.142.189
Unique ID:	804551924
Location:	

Name	Susan Boscov
Subject:	no widespread spraying for mosquitoes
Comments:	So much damage can be done to our enironment, to the insect we need for pollination, to birds, and to us! This is a terrible plan! Please do not implement widespread sprayig for mosquitoes.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	May 5, 2021 7:43 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	209.6.196.149
Unique ID:	804569286
Location:	

Name	Roberto Lim
Subject:	Please reconsider this poorly informed and short sighted policy!
Comments:	Widespread spraying for mosquitoes with toxic pesticides is a short sided and horrible public health policy. There is inadequate research on the effects on human health and on other aspects of the ecosystem. We already have a mass extinction of insects occurring. Please reconsider this policy and take more holistic and systemic actions for public health. Thank you!

Public Comments Received

June to August 2021

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 1, 2021 4:03 pm
Browser:	Safari 14.1 / OS X
IP Address:	97.95.176.142
Unique ID:	816761529
Location:	

Name	Karen Masterson
Subject:	aerial mosquito spraying
Comments:	We simply must reform our approach to how we manage pest pressure and stop using blanket approaches that are doing more harm than the good that is intended. When we poison the planet we inevitably end up poisoning ourselves as well as a host of other unintended species.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 4, 2021 4:21 pm
Browser:	Firefox 78.0 / OS X
IP Address:	73.38.159.235
Unique ID:	818733627
Location:	

Subject:	mosquito spraying
Comments:	Hello, I think aerial spraying should only be used as a last resort given that these sprays contain known carcinogens and forever chemicals. Here in wellesley, my town, there are plenty of places with standing water that should be tackled by the city/state which would eliminate breeding. The food web is fragile, most flowering plants need pollinators, and pollinators are under assault to a very serious degree-- pesticide use is the number one cause of the threat to the food web, so we should keep that larger hazard in mind. It would be great if the state or cities had a more aggressive approach to eliminating dangerous standing water sites, eg if people could submit places in an online site like this and feel confident it would be handled without pesticides, ie by draining etc.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 5, 2021 10:27 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	74.104.141.209
Unique ID:	819038756
Location:	

Name	Catherine LeBlanc
Organization / Affiliation:	Sierra Club volunteer
Subject:	Mosquito Control
Comments:	For public health from PFAS to lung conditions, a science based, multiple tiered strategy, for a more effective and safe mosquito disease policy must be implemented with 21st century up to date data.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 9, 2021 2:47 pm
Browser:	Chrome 91.0.4472.77 / Windows
IP Address:	72.74.83.35
Unique ID:	821562973
Location:	

Name	Dorothy McGlincy
Organization / Affiliation:	Massachusetts Association of Conservation Commissions
Subject:	Scientific American Article- Pesticides are Killing the World's Soils. https://www.scientificamerican.com/article/pesticides-are-killing-the-worlds-soils/
Comments:	https://www.scientificamerican.com/article/pesticides-are-killing-the-worlds-soils/

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 11, 2021 4:49 pm
Browser:	Safari 14.1.1 / OS X
IP Address:	108.49.47.130
Unique ID:	822529114
Location:	

Name	Cindy Ostrowski
Subject:	Develop a science based, ecological mosquito control program going forward
Comments:	Too much pesticide spraying! Ecological mosquito management prioritizes preventative measures, and includes: -Monitoring and surveillance -A strong focus on public education and personal protective measures -Emphasis on eliminating breeding sites -Consideration of local ecology -A tiered approach to management: -Non-toxic approaches, such as habitat manipulation must be attempted first. -Larvaciding should be conducted based on monitoring for predefined thresholds. -Adulticiding (spraying for adult mosquitoes) should be permitted ONLY during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective. Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals' associated with a range of diseases. The unknowns associated with toxic, EPA registered pesticides underlines the need for an approach that does not place these products at the top of the toolbox. To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 13, 2021 8:21 am
Browser:	Safari 14.0.3 / OS X
IP Address:	73.238.95.137
Unique ID:	822896344
Location:	

Name	Karen Spencer
Subject:	Chemical impact on sensitive populations & environment
Comments:	The heavy use of chemicals to control mosquitos and other pests has had a devastatin impact on various populations and the planet. Some of us are more sensitive than others and experience debilitation acute effects from community spraying, but all of us are vulnerable to long term effects which range from birth defects in our children to degenerative neurological disease. No matter what the safety claims, we don't know what we don't know until it is too late. I urge a conservative approach to any and all chemical use, because chemicals invariably wreak havoc of many individuals and pollute the environment.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 13, 2021 2:02 pm
Browser:	Chrome 91.0.4472.101 / Windows
IP Address:	96.233.163.38
Unique ID:	822964306
Location:	

Name	Daphne Bye
Subject:	Opting Out of Mosquito Spraying
Comments:	The State is now reviewing 34 completed municipal opt out applications. We now await review and approval by the Executive Office of Energy and Environmental Affairs (EEA) and Department of Public Health. According to Craig Gilvarg, EEA Deputy Communications Director, applications to opt-out will be "reviewed with consideration of historical arbovirus risk, the impact of the opt-out application regionally, and the implementation of an alternative mosquito management plan." Any Municipal Opt-Out application deemed deficient for approval should be returned to the Municipality with comments for amendments and resubmission. Declination of applications by the State review team should not be an option. I encourage the State to approve the submitted Municipal Opt-Out applications. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 15, 2021 9:47 am
Browser:	Safari 14.0.3 / OS X
IP Address:	71.233.175.207
Unique ID:	823940551
Location:	

Name	Patti Amaral
Organization / Affiliation:	Resident
Subject:	Opt-Out Program for Mosquito control
Comments:	Please Opt-Out of this Mosquito control program. Our world is so full of so many chemicals and we know there are other ways to fix this. Introduce bats and other creatures that eat mosquito's instead of spraying as the apple that you eat could of been sprayed with these chemicals. Enjoy!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 25, 2021 10:32 am
Browser:	Chrome Mobile 91.0.4472.120 / Android
IP Address:	73.167.110.228
Unique ID:	828175359
Location:	

Name	Wendy Goodman
Subject:	Mosquitoes and Mass fish and wildlife
Comments:	I'm thrilled that this task force is in place, I thought Jo Comerford's article in the recorder was wonderful...I appreciated not only the information but the perspective as well. thank you. I I want to comment on Green River road in Colrain where Mass fish and wildlife own a lot of the property . There are ditches along the road that are always wet and mosquito nurseries. Mass wildlife is rarely out here taking care of their properties. I have requested over the years that somehow these ditches get filled and nothing has happened. It should not be the town of Colrain's responsibility, they already pick up enough of MA Wildlife's impacts. Please include them and help them step up to the plate and take responsibility for all of their wildlife areas, not just along the Connecticut River. Thank you again for taking a more holistic approach, and please do hold Mass wildlife accountable for their properties, and help the small towns to deal with it.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 25, 2021 5:45 pm
Browser:	Chrome 91.0.4472.114 / OS X
IP Address:	75.69.137.28
Unique ID:	828385874
Location:	

Name	Lisa Rigsby
Subject:	Recorded Meetings
Comments:	All meetings should be recorded and available to the public. There is a lot of material covered, this is a complex topic; especially for people with disabilities or impairments. Everyone should have access to review this at their own pace. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	June 25, 2021 8:32 pm
Browser:	Chrome 91.0.4472.114 / Windows
IP Address:	67.142.100.25
Unique ID:	828428813
Location:	

Name	Jane Alessandra
Subject:	taped sessions
Comments:	hi, You need to have tape recordings of all sessions. This is standard practice in town meetings and other important meetings. This is necessary so we can hear what is said, rather than a secondhand interpretation and summary of only part of what is said. It is necessary to establish trust and for transparency. thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	July 13, 2021 9:39 am
Browser:	unknown / unknown
IP Address:	161.77.224.114
Unique ID:	834943830
Location:	

Name	Ziporah Hildebrandt
Organization / Affiliation:	Resident
Subject:	Logging practices can encourage mosquitoes
Comments:	When I was researching for a book I wrote on a Brazilian environmental activist, I encountered information relevant to mosquitoes in any forested areas. According to my research, the incidence of malaria, a mosquito borne illness, in the Amazon rainforest was very low before logging operations created access roads. Puddles formed, mosquitoes bred, and malaria skyrocketed. Massachusetts allows widespread logging operations on both public and private land without any requirement to fill in holes to eliminate puddles and pevent mosquitoes. This would not be a difficult or expensive fix for logging operations and would significantly reduce mosquito and other biting insect populations.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	July 19, 2021 8:04 pm
Browser:	unknown / unknown
IP Address:	216.193.164.165
Unique ID:	837374208
Location:	

Name	Laurel Facey
Organization / Affiliation:	Wendell AgCom
Subject:	Being able to opt out.
Comments:	When a town has researched the issue and opts out, such as in Orange, there should not be the ability of the state to override that local knowledge and desire. Opting out requires an alternate plan which, once done, should be adequate to allow opting out.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	July 19, 2021 9:03 pm
Browser:	unknown / unknown
IP Address:	73.149.246.72
Unique ID:	837387228
Location:	

Name	Catherine LeBlanc
Subject:	Aerial spraying for mosquitos
Comments:	I am opposed and want aerial spraying for mosquitos to stop. Thank you

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	July 26, 2021 5:09 pm
Browser:	Chrome 92.0.4515.107 / Windows
IP Address:	67.142.100.223
Unique ID:	839813413
Location:	

Name	Jane Alessandra
Subject:	Opt IN comments on 5/3 clearly ignored in letter to town approving opt out -
Comments:	The Opt Out approval letter to my town included this paragraph, "Guidance for next year's opt-out application program will be forthcoming. We expect that the application will have an expanded scope and requirements, and applications will be subject to significantly more stringent review. There should be no expectation that an approval decision for the 2021 season will carry forward to the 2022 season." This after virtually everyone on 5/3 (EXCEPT THOSE AFFILIATED WITH MOSQUITO CONTROL) said, "We want Opt In. It was too onerous. We want freedom of not having Anvil poison trespassing on our land, our bodies, our animals." It is incredibly discouraging that BEFORE you even hear the independent study you've commissioned, you've announced to towns that you're moving towards more spraying and less control for the people who DO NOT WANT THIS. Adulticide spraying is an overreaction to something that has caused less than 200 deaths in a century, when the CDC says 9 people die of asthma each day and multiple chemical sensitivity effects 4-6% of the population, when Anvil is harmful to both these groups and to more.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	July 27, 2021 6:55 pm
Browser:	Firefox 90.0 / Windows
IP Address:	76.119.176.221
Unique ID:	840281971
Location:	

Subject:	IF town says it wants to opt out by God do so
Comments:	My town and many others in this region no less the state have gone through the laborious process of filling in the prereqs to opt out only to have this overruled. That is not democratic, and unAmerican. On top of that you're spraying harmful (PFAS) chemicals across the landscape largely unnecessarily. The risk factor of mosquito disease borne illness is very very low. What is clear is that the chemical spray industry has this Task Force in its pocket as in unduly influences its decision making which is not sceince driven.

PUBLIC COMMENTS RECEIVED

August to September 2021

Massachusetts Lobstermen's Association
8 Otis Place ~ Scituate, MA 02066
781.545.6984

August 25, 2021

Massachusetts Mosquito Task Force

RE: Mosquito spraying efforts in the Commonwealth

Dear Task Force Members,

The Massachusetts Lobstermen's Association (MLA) respectfully submits this letter of great concern on behalf of its 1800 members regarding mosquito spraying being undertaking in the Commonwealth. The MLA members greatly depend upon smart and ecofriendly measures to mitigate mosquitos while protecting the healthy ecosystem they depend upon to earn a living.

The MLA has been hearing from several of its members about these ongoing efforts and they are greatly concerned that the impacts to the lobster resource will be equal to what happened in Long Island Sound LIS) in the early 2000's when the EEE outbreak happened. Unfortunately, the lobsters and several other species in the LIS were killed and have yet to return.

Established in 1963, the MLA is a member-driven organization that accepts and supports the interdependence of species conservation and the members' collective economic interests. The membership is comprised of fishermen from Maryland to Canada and encompasses a wide variety of gear types from fixed gear and mobile gear alike. The MLA continues to work conscientiously through the management process with the Division of Marine Fisheries and the Atlantic States Marine Fisheries and the New England Fisheries Management Council to ensure the continued sustainability and profitability of the resources in which our commercial fishermen are engaged in.

While there have been several "new" laws and several "new" chemicals created over the last twenty years to protect the ecosystem while killing mosquitos and their larvae, the MLA does not believe there are any safe chemicals that have been created that will not only kill the mosquitos and their larvae but also the lobsters and their larvae. The detrimental impact this will have on the entire commercial lobster industry would be catastrophic.

The Commonwealth has over 750 active commercial lobstermen that employ thousands of crew and support the local shoreside businesses while landing over 18 million pounds of American Lobster with an estimated value of 380 million dollars to the local economy. The negative economic impact would be catastrophic and felt in the local restaurants, stores, and on the tax base as the industry would be shut down should there be any use of chemicals near any watershed feeding into the ocean.

The MLA has been following the ongoing LIS issue over the years and after reviewing numerous papers and articles we are extremely concerned about any use of the chemicals that were used in Connecticut. The paper Malathion immunotoxicity in the American lobster (*Homarus americanus*) upon experimental exposure by *Sylvain De Guise a,*, Jennifer Maratea a, Christopher Perkins ba and the Department of Pathobiology and Veterinary Science, University of Connecticut,* concluded that "our results suggest that lobsters are highly sensitive to both the lethal and sub-lethal toxicity of malathion in sea water. A reduction in immune functions could likely result in an increase susceptibility to infectious agents, and could have contributed to the mass mortality if exposure was sufficient."

Furthermore, the report RESPONDING TO A RESOURCE DISASTER: AMERICAN LOBSTERS IN LONG ISLAND SOUND 1999 – 2004 by: *Nancy Balcom1 and Penelope Howell2, CTSG-06-02, 1Connecticut Sea Grant, University of Connecticut 2CT Dept. Environmental Protection, Marine Fisheries Division* found that "Pesticides were being applied in both states to combat the spread of the West Nile virus, which had caused seven human deaths by early September. Lab studies showed that these pesticides can have sub-lethal or lethal effects on the various life stages of lobsters, depending on the exposure time and concentration."

The Massachusetts Lobstermen's Association continues to monitor this most sensitive issue up and down the coast as the last thing we want to see is a repeat of Long Island Sound here in Massachusetts. Thank you for your thoughtful consideration and should you have any follow up questions please feel free to reach out to me directly.

Sincerely,

Beth Casoni
MLA, Executive Director
www.lobstermen.com

2021-09-16

Dear Mosquito Control for the 21st Century Task Force,

I am a primary care physician licensed in Massachusetts and want to express my concerns regarding the proposed Act to Mitigate Arbovirus in the Commonwealth based on my experience with patients who have a variety of illnesses as a result of exposure to environmental chemicals, including pesticides.

I am advocating that you eliminate the practice of widespread aerial and truck spraying of both adulticides and larvicides in your plans. Chemicals should be applied locally and specifically on target species to minimize impact on humans and non-target species. Personal Property Exclusions should be honored, even in a declared public health emergency.

As a patient population, chemically injured patients are extremely ill, often permanently disabled, and remain extremely sensitive to additional exposures to environmental chemicals and pesticides, even minute amounts. I am deeply concerned about a policy of spraying pesticides, aerially or by truck, and especially the policy of cancelling Personal Property Exclusions during a declared state of health emergency. These patients can remain sensitive to the effects of pesticide exposure long after the reported dissipation of the chemicals, which worsens their condition and result in a cascade of health effects, and even more, can render them homeless if they cannot safely return to their residence after spraying. Per the Coast Range Forest Group, aerial drift has been measured up to 8 miles from a target area (https://coastrangeforestwatch.org/research-and-resources-on-the-negative-effects-of-pesticide-and-aerial-spray/).

I recommend that you refer to the testimony of Jean Lemieux, president of the MA Association of the Chemically Injured, sent to this task force in a letter dated 05/05/2021. She quotes Ashford and Miller: "Among the most hazardous exposures for patients seem to be pesticides sprayed outdoor or indoors. Alone, pesticides have accounted for some of the most advanced and persistent cases . . . pesticide exposures are associated with the recurrence of symptoms . . . and can, worsen their level of . . . intolerance . . . . The existing standards of OSHA, EPA and state agencies do not . . . protect those individuals."

Ms. Lemieux further states that surveys find that 4-6% of the population are chemically injured to the point of chronic and permanent illness. In MA, that would come to ~276,000 – 414,000 residents. A 2002 Western MA survey by the nonprofit Environmental Health Coalition of Western Massachusetts (EHCWM) found that 57% of chemically injured respondents had experienced homelessness and that the rate of homelessness was significantly higher than the general population (https://fdocuments.net/document/environmental-health-group-2002-mcs-housing-survey.html). I have witnessed chemically injured patients under my care lose their homes and belongings due to pesticide use and spray in their area, including chemical drift incidences.

Proposed remedies to the impact of exposure are inadequate and untenable. Many of these patients have taken great pains to find a home and environment in which they are safe and can tolerate. To ask them to leave an area during chemical spraying and until the chemicals break down is not possible. Additionally, homes w/ closed windows are still permeable unless they have positive air pressure, unlikely in residential properties. HEPA filters are unlikely able to successfully filter pesticide particles. Degradation indoors is likely to be different from that which is measured outdoors (in direct sunlight, for instance).

I feel I cannot overstate the risk to the health and well-being of this vulnerable population. I have witness firsthand among patients I care for the difficulties they face in finding safe housing and environments. I strongly urge you to avoid a policy that includes widespread, non-targeted aerial and truck spraying for the sake of this group of individuals, as well as for many others who are susceptible to ill-effects from this practice, including patients with asthma, cancer, immune disorders, children and those who are pregnant. Additionally, Personal Property Exclusions for health reasons should be honored, even in a declared public health emergency – in order to prevent another health emergency among these individuals.

Sincerely,
Linnea Meyer, MD

Jones River Watershed Association

781-585-2322 • 55 LANDING ROAD, KINGSTON, MASSACHUSETTS 02364 • WWW.JONESRIVER.ORG

17 September 2021

Via Website Comment upload

Mosquito Control for the Twenty-First Century Task Force
Executive Office of Energy and Environmental Affairs
Department of Public Health
c/o Beth Card
https://www.mass.gov/orgs/mosquito-control-for-the-twenty-first-century-task-force

RE: Comments on ERG August 2021 Report to the Task force

Dear Chair Card and Members of the Task Force,

The Jones River Watershed Association (JRWA) offers the following comments in hope that the Commonwealth can ultimately cease and desist from the aerial and truck mounted application of pesticides in Massachusetts under the pretense that this is the best use of limited financial resources to curb the threat of mosquito borne disease. We do not doubt that unchecked and prolific population booms of mosquitoes can increase the threat of disease, rather, we are convinced, from direct observations over decades, that more harm than good is delivered to the environment through the use of this method of attempted control. The ERG Report does not dispel this belief.

JRWA has been working for over thirty-five years within the southeast region to restore, protect and conserve natural resources for current and future generations. We live and work on the front line of climate change and spend the better part of our time on projects that preserve the integrity of wild spaces, improve water quality, restore riverine habitats for native and migrating species, and reconnect this vital ecosystem that brought people to this region in the first place.

Over time, since the late 70's members of our organization have argued and fought against various excuses for broad reaching pesticide applications from the air including sevin, malathion, anvil 10 + 10 and others. First as organic farmers in the cranberry world we saw not only pollinators, but other insects that voraciously eat all manner of pests, especially the dragon fly, be decimated by the misguided application of poison from the air—even though, **theoretically**, water supply reservoirs we were farming next to, were intended to be exempt.

The headwater of the Jones River is Silver Lake, the overused water supply for the City of Brockton and Town of Whitman. Silver Lake is a glacial lake, 80 feet at its deepest location. It is one of the twelve largest lakes in Massachusetts. The Jones River is the largest river draining to Cape Cod Bay. Both the Jones River and Silver Lake have been reclassified as Coldwater Fish Resource after removal of two mainstem dams and stormwater improvement and sewer projects in town. This should be evidence of local commitment to our environment.

The State should NEVER apply pesticides to the Jones River or Silver Lake. Yet this is done as evidenced by the spray route maps of 2019 and 2020, and the PFAS found in Silver Lake. It also occurred in each spray season before the recent episode. This does significant, known and visible damage. DMF never agreed to the pesticide applications—yet for some unknown reason the State views itself as exempt. Each and every aerial application over the past 40 years has had some damaging impact—whether it was the Glen Charlie and Agawam River fish kill of more than a million in 1990, the floating dead mud crabs in the Jones at low tide in 2006, or the gazillion other creatures in the mud that we don't see to count. Mosquitos do not survive in a healthy river, pond or lake. They are food for fish and birds. They are not the treat. They are eaten before they can bite. How is it defensible for the Commonwealth to liberally apply known aquatic poisons to such important resources? The ERG Report failed to even bring up this issue as part of its study.

We do not doubt the need for monitoring, the management of stagnant sites, especially stormwater infrastructure, tires, gutters, and rain barrels. People and communities need way more education. The Report could have covered this in some detail and did not. The education provided by the Towns and Districts is mostly limited to alerts, which instills panic not protective action. People need to physically be engaged. We need a "Manual for Protection Against Mosquito Disease", especially if we are starting to watch out for the carriers of *dengue* and the like, as the Report suggests. "What every homeowner needs to know". "How to keep your community safe" a "Homeowner Association's Guide to tend their stormwater ponds and ditches"…..

These are a few suggestions. Information on how fast a mosquito turns from a larval stage to disease spreader would be helpful. Life cycle information is vital to comprehensive management. Going after one thing and destroying everything else, and calling it a good job, with no real efficacy standard is theft of taxpayer money. But more than that, it takes needed resources away from restoration practices to undo and correct the useless, damaging and degraded post-industrial era leftovers. We need to put more funding into restoring river and stream connectivity—not into pretending that flying over a wooded swamp at night or dawn applying pesticides will do anything other than damage needed species and flush the funds, and the poisons, down the flowing drain. Restoration is a big one-time expenditure and does require less rigorous maintenance. But it gives back—it does not take away. Poisoning the environment degrades ecosystems. Is it any wonder the fish and eels are disappearing? These creatures control way more mosquito breeding than any human with a poison wand. The Report should have addressed missed opportunities and the real deal about IPM. Killing off our main defense mechanisms is not the key to survival.

There is no evidence in the Report that broad scale spraying reduces disease. There is evidence from the labels that most if not all are harmful to fish and aquatic invertebrates, arguably the most effective population control system we have. The constant practice of the Pesticide Board is to support use of chemicals. The practice of DPH is to be so fearful of an outbreak of EEE and now WNV that they have been willing to allow the widespread use of chemicals, whether that use directly reduces the threat of disease or not, and regardless of the unintended consequences to human and environmental health. We understand the fear. We do not understand or accept that subjecting humans and animals to further harm justifies their use. Nor do we understand ERG's model that suggests "*if all chemical mosquito control methods were stopped there would be more than double the number of WNV cases and a 275 percent increase in EEE cases.*" This adds more confusion to the discussion. Is ERG equating BTI larvicide, with Duet, Anvil, Maverick etc.? Is ERG suggesting the alternative is to just stop all control efforts? This is a mischaracterization of the objections to current practices. Noone is saying "don't do anything to control mosquito breeding and disease. What we are saying is we have more tools in the tool box to manage this threat. We need to understand and improve stormwater retention basin stormwater basins and catch basin maintenance. For example, we also can adopt and properly fund some routine maintenance and improve drainage so these places do not explode with nuisance or disease vectors? In what world would we do nothing?

In addition, in our town we have lots of former cranberry bog acreage. The ditches are usually blocked and flow is absent or stagnant. We need a strategy to systematically map these and begin to provide restoration of the natural habitats that will keep mosquito breeding in check. This is where the MCDs are needed with their manpower and equipment. A program for mapping hotspots and a schedule for addressing them. Sharing information, rather than protecting the pesticide turf is what is needed most. This way the community can engage and learn more too.

Thank you for the opportunity to comment and the work of the Mosquito Control Task Force. We urge greater caution in the use of poisons. An ALL STOP for repetitive aerial pesticide applications from planes or vehicles broadcasting along residential roadways. We urge MORE on the ground maintenance of man-made and abandoned infrastructure and impounded bogs and ditches coupled with efforts to create habitat connectivity. We support Senate Bill 556 and MORE comprehensive public and community-based education.

Sincerely,

Pine duBois, Executive Director
pine@jonesriver.org
781-424-0353

cc:
Rep. Kathleen LaNatra; Senator Su Moran

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Belmont
Boston
Brookline
Burlington
Cambridge
Chelsea
Concord
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Framingham
Lexington
Lincoln
Maynard

THE COMMONWEALTH OF MASSACHUSETTS
STATE RECLAMATION & MOSQUITO CONTROL BOARD

EAST MIDDLESEX MOSQUITO CONTROL PROJECT
SUFFOLK COUNTY MOSQUITO CONTROL PROJECT
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Phone: 781-899-5730 Fax: 781-647-4988
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Melrose
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North Reading
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Wakefield
Waltham
Watertown
Wayland
Wellesley
Weston
Winchester

September 17, 2021

Task Force Members,

My name is Brian Farless, Superintendent for East Middlesex Mosquito Control Project (EMMCP) and Suffolk County Mosquito Control Project (SCMCP). In regards to the Eastern Research Group report, I would like to bring to your attention a couple of items.

Page 121, Table 4-4. Overview of Bacterial Insecticides Used in the Commonwealth of Massachusetts
The table lists that zero pounds of Vectobac G and Vectobac GS were used by all of the Mosquito Control Districts (MCD) from 2018-2020. As seen in the Annual Reports, Suffolk County and East Middlesex used Vectobac G/GS during 2018-2020.

- During 2018, SCMCP used 360 lbs of Vectobac G
- During 2018, EMMCP used 9,532.5 lbs of Vectobac G.
- During 2019, no G or GS was used by SCMCP.
- During 2019, EMMCP used 9,920 lbs of Vectobac G.
- During 2020, no G or GS was used by SCMCP.
- During 2020, EMMCP used 9,880 lbs of Vectobac GS.

Page 198, Table 4-1. MCD Budgets for Education and Public Engagement
The table lists 0% of the Suffolk County budget was used for education and public engagement. In the spreadsheet that was supplied by Suffolk County, it was listed that 15% of the budget was for education, outreach, public education and research.

Page 204, Table 5-2. MA MCDs and Projects That Reported Stormwater Device Management Activities Between 2016 and 2020
Under the column “Catch Basin Cleaning”, the chart says that Berkshire County, Norfolk County, Northeast and Suffolk County does catch basin cleaning. None of the mosquito control districts clean catch basins. Cleaning catch basins isn’t a form of mosquito control.

Catch basins are cleaned to prevent flooding and clogged pipes. Whether using a clam or vacuum truck, catch basin cleaning is not a mosquito control measure. When catch basins are cleaned with a clam truck (removing solids), mosquito larvae remain in the basin, and the basin water will continue to attract egg laying mosquitoes. When a vacuum truck is used, not all of the water is removed, therefore not all of the mosquito larvae are removed. Furthermore, the water remaining in the basin is still attractive for egg laying mosquitoes.

Both East Middlesex and Suffolk County communicate with each municipality as to when catch basins are cleaned. All of the 28 cities and towns in East Middlesex and Suffolk County clean catch basins yearly. MCD personnel coordinate with the municipality as to when basins will be cleaned, that way, larvicide can be applied after the catch basins have been cleaned. Applying larvicide after basins have been cleaned ensures that larvicide won't be removed during the cleaning process.

Thanks for taking the time to consider these items during your discussions.

Kind regards,

Brian Farless, Superintendent
East Middlesex Mosquito Control & Suffolk County Mosquito Control

TOWN OF LINCOLN
BOARD OF HEALTH
CONSERVATION COMMISSION
AGRICULTURAL COMMISSION
16 LINCOLN RD LINCOLN, MA 01773
WWW.LINCOLNTOWN.ORG

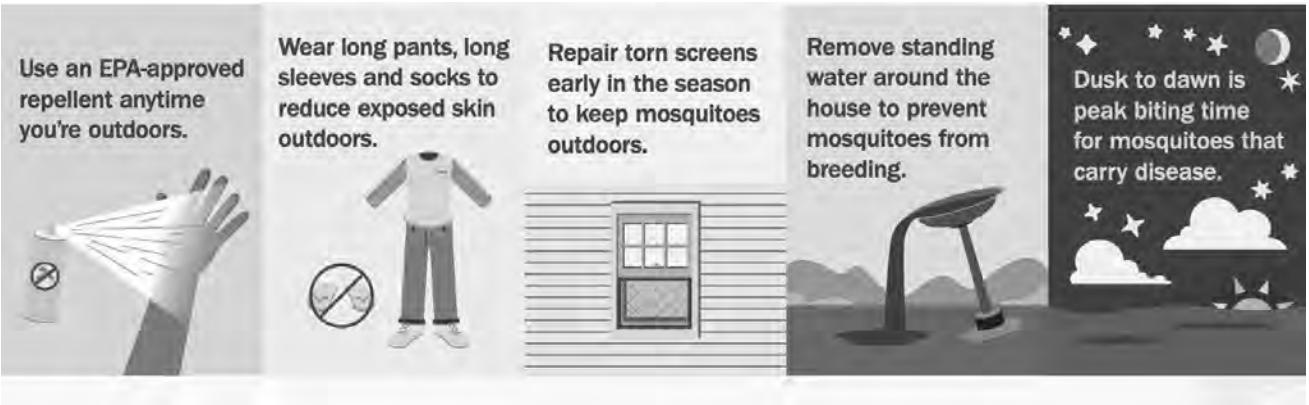
LINCOLN LAND
CONSERVATION TRUST
P.O. BOX 10
LINCOLN, MA 01773
WWW.LINCOLNCONSERVATION.ORG

April 2021

Dear Lincoln Neighbor,

Mosquito season is upon us! As such, the Lincoln Board of Health, the Conservation Commission, the Agricultural Commission, and the Lincoln Land Conservation Trust are reaching out to you with the enclosed brochure that describes ways for you to deter mosquitoes and prevent their bites while enjoying the outdoors. These preferred prevention measures do not include the spraying of chemicals designed to kill mosquitoes or their larvae. Instead, the emphasis is on preventing bites through personal protection and repelling the mosquitoes. This approach has the additional benefit of preventing unintended harmful consequences of chemical spraying to humans, pets, livestock, crops, insects, birds, and the entire food chain.[i]

There are many companies who sell mosquito and tick prevention services to residents, most of which include chemical management techniques. These companies often imply that the insecticides they spray on yards are safe for everything except mosquitoes and/or ticks. However, some of these companies are also very reluctant to reveal what chemicals they use.[ii] Instead of hiring a company to spray chemicals on and around your yard, we hope you will focus on the prevention measures outlined in the enclosed brochure. Furthermore, no spraying may be performed within 100 feet of a wetland or 200 feet of a year-round flowing stream without it first being reviewed and approved by the Conservation Commission.



Lincoln is part of the East Middlesex Mosquito Control District (EMMCD) and the Town pays for annual mosquito surveys and surveillance. This involves select trapping and testing of mosquitoes in Lincoln. The results of the testing are shared with the Lincoln Board of Health and if infected mosquitoes are discovered in Lincoln, residents will be notified. Please note that the Town does not fund annual spraying of mosquito larvae or adults and therefore, EMMCD does not conduct any chemical management in Lincoln.[iii]

Mosquitoes are a deterrable pest. It is important we all do our part to prevent mosquito bites because a very small number of mosquitoes may be infected with diseases such as West Nile Virus and Eastern Equine Encephalitis (EEE). Fortunately, the risk of such diseases is extremely low in Lincoln. Historical surveillance data available at the Department of Public Health revealed that there have been ZERO instances of mosquitoes with EEE detected in Lincoln in over 60 years.

We hope you find the enclosed brochure helpful, and that it provides you with the tools you need to confidently enjoy the outdoors without worrying about mosquitoes and their bites. If you have any questions, please do not hesitate to reach out to us. We look forward to seeing you on Lincoln's trails!

Sincerely,

The Lincoln Board of Health

The Lincoln Conservation Commission

The Lincoln Agricultural Commission

The Lincoln Land Conservation Trust

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i Chemicals used to kill mosquitoes are toxic to invertebrate and fish populations. See "Mosquito Control and Spraying" at www.mass.gov/service-details/mosquito-control-and-spraying.

ii To learn what active ingredients there are in many of the chemicals that mosquito companies use, see: https://colinpurrington.com/2018/09/buzz-on-mosquito-sprays/.

iii In 2019, the Board of Health authorized a one-time emergency spraying of the area around the Lincoln schools when parents expressed concerns after a child from Sudbury was diagnosed with EEE.

PROTECT YOURSELF from MOSQUITO BITES

Preventing Mosquito Bites

This brochure was produced by the MA Department of Public Health with modifications made by the Town of Lincoln (www.lincolntown.org)

Why is it important to prevent mosquito bites?

Mosquitoes can spread diseases that make you sick. In Massachusetts, mosquitoes can give you Eastern Equine Encephalitis (EEE) virus and West Nile virus (WNV).

West Nile virus infections are more common than EEE, but still rare. Most WNV infections do not cause any symptoms. Mild WNV infections can cause fever, headache, and body aches, often with a skin rash and swollen lymph glands. A small number of people (less than 1 out of 100) who get infected with WNV develop more serious illness; this is more common in people over the age of 50. Symptoms of serious illness can include headache, high fever, stiff neck, confusion, muscle weakness, tremors, convulsions, coma, swelling of the brain, and sometimes death.

Eastern equine encephalitis (EEE) is an extremely rare but serious disease. Symptoms include high fever, stiff neck, headache, and lack of energy. Swelling of the brain, called encephalitis, is the most dangerous complication, and can cause coma and death. Most cases in Massachusetts occur in the southeastern part of the state, but recently there has been an increase in cases occurring in other parts of the state. See your doctor if you develop these symptoms.

What is the best way to prevent mosquito bites?

- When weather permits, wear long-sleeves, long pants and socks when outdoors.
- Be aware of peak mosquito hours. The hours from dusk to dawn are peak biting times for many species of mosquitoes. Take extra care to use an EPA-approved repellent and protective clothing during evening and early morning. Make sure to follow directions on the repellent label.
- Be aware of mosquitoes around you. If mosquitoes are biting you, reapply repellent, or think about going inside.
- Use mosquito netting on baby carriages or playpens when your baby is outdoors.
- Make sure screens are repaired and are tightly attached to doors and windows.
- Remove standing water from places like gutters, old tires, and wheel barrows. Replace the water frequently in bird baths and wading pools. Mosquitoes can begin to grow in any puddle of standing water that lasts for more than four days, so don't let water collect around your home.

Only a small number of mosquitoes are infected at any given time, so being bitten by a mosquito does not mean you will get sick. However, the best way to avoid both of these illnesses is to prevent mosquito bites.

What can I do to protect my animals?

Mosquitoes can infect horses and other animals. Horses are susceptible to WNV; and horses, llamas, alpacas, and certain birds can get EEE. WNV and EEE viruses are not spread from horses or other mammals to humans in any way.

WNV and EEE viruses are not spread from horses or other mammals to humans in any way.

- Licensed vaccines for horses are considered highly protective and can even be used in some other animals. Talk with your veterinarian about vaccinating your animals.
- Eliminate standing water by getting rid of items that can collect and hold water such as flower pots, tires, and containers. Cleaning out (not just topping off) animal water buckets and troughs at least twice weekly will reduce mosquito breeding habitats.
- Consider screening stalls if possible or install fans to help deter mosquitoes.
- Keep animals indoors during peak periods of mosquito activity (dusk and dawn).
- Avoid turning on lights inside barns during the evening and overnight because mosquitoes are attracted to light.
- Apply mosquito repellents approved for use on animals. Read the product label before using, and follow all instructions.

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September 17, 2021

Mosquito Control for the Twenty-First Century Task Force
Executive Office of Energy and Environmental Affairs
100 Cambridge St.
Suite 900
Boston, MA 02114

Dear Members of the Mosquito Control for the Twenty-First Century Task Force,

Thank you for the opportunity to provide comment on the Mosquito Control Task Force (MCTF) Report. The Report confirms that there is no quantifiable evidence that current practices, which include routine spraying of synthetic pyrethroid adulticides, are effective in reducing mosquito-borne diseases. It is recognized that synthetic pyrethroids used to manage mosquitoes can be carcinogenic, harm the liver, disrupt the endocrine (hormone) system, and persist in the environment; these chemicals are further identified as being "very highly toxic" to aquatic fish and invertebrates. Despite acknowledging the dangers of these pesticides and lack of data on effectiveness of the current program, the Report claims that reducing spraying could increase cases of WNV and EEE. This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. Ultimately, the current mosquito control regime in Massachusetts does more harm and good, and poses significant risks to the Commonwealth's economy, society, and environment.

The MCTF Report provides a range of information about the history and current practices of mosquito control in Massachusetts, however, it fails to fulfill its scope of work in critically important areas relevant to the efforts of the MCTF. The modeling in Section 8 is fundamentally flawed, and we request that this comment be included in the corrections/errata section of compiled comments on the report:

- The analyses of impacts of pesticides on vulnerable populations, pollinators, and ecological health are incomplete. The Report provides details on honeybees but does not account for the hundreds of species of native bees, or the thousands of other beneficial insects (e.g. moths and other native pollinators and parasitic wasps and tachnid flies) that help keep agricultural and forest pests in check.
- While data on the risk and cost of mosquito borne diseases are provided a detailed analysis, a similar review is not provided for pesticide-induced diseases. The Report mentions some health and environmental impacts from the pesticides used but does not characterize risk in a statistical format, or account for the health care costs of pesticide-induced diseases or damage to the wider environment. Furthermore, the modeling of predicted increases in mosquito-borne disease if spraying were to be halted is fundamentally flawed and unscientific, especially in the absence of data on how current practices are actually influencing disease risk.
- Hazardous PFAS compounds were detected in the pesticide used by the state to aerially spray mosquitoes, yet there are no recommendations for sampling all pesticides for PFAS and evaluating "inert" chemicals in product formulations to be certain the materials used for mosquito control do not impact water quality, pollinators, and the environment.

Notwithstanding glaring omissions, the Report provides sufficient evidence to recommend a complete overhaul of Massachusetts' approach to mosquito management:

- At present, the Commonwealth, through the State Reclamation Board, is primarily responsible only for deciding whether to aerially spray pesticides and does not substantively assist with other mosquito abatement activities, such as public education, larviciding, and source reduction.
- Mosquito Control Districts (MCDs) operate in a decentralized way that limits data sharing and implementation of best practices. State agencies and MCDs are generally out of line even with best practices established by the American Mosquito Control Association.
- For all but one MCD, standards are not applied to target larviciding and adulticiding towards nuisance or disease vector mosquitoes. The lack of differentiation between nuisance and disease vector mosquitoes in determining whether to spray means that there is no actual basis for the statistical modeling in the Report on the effect of pesticides in reducing disease vectors.
- Communities that are not part of MCDs are left with very limited resources for mosquito surveillance or abatement. Despite an opt-out program, the state can override opt-out requests from local communities, beekeepers, gardens, schools, land trusts, and chemically sensitive individuals.
- State agencies and MCDs are not adequately assessing resistance within target mosquitoes, particularly disease carrying mosquitoes. The Report notes that there are no data on whether *C. perturbans*, the primary vector for EEE, is resistant to synthetic pyrethroids. It is noted that the state and MCDs do not widely share data on resistance tests or track the general effectiveness of their management strategies.
- The Report indicates that reducing pesticide use - both by public agencies and private businesses - and emphasizing non-chemical strategies can reduce insecticide resistance. This will ensure that toxic pesticides are effective when true public health emergencies exist.

In Section 4 the Report discusses the need to consider tradeoffs, like the removal of nuisance mosquitoes against the ecological risk that results from an application. This is the outdated mindset that the Commonwealth must move beyond. Furthermore, the report confirms that there is no data available upon which to measure or weigh these trade-offs. Applications of highly toxic pesticides for nuisance mosquitoes is not in line with best practices, places human health and the environment at unnecessary risk, and is not representative of a 21st century approach to mosquito management. Mosquito management must be reoriented towards a focus on stopping mosquito borne disease through ecologically-based control measures that target disease-carrying mosquitoes.

In sum, despite its oversights the Report provides a basis for reorienting the role of state agencies in mosquito management, including adoption of the comprehensive, centralized approach outlined in H.937/S.556, *An Act providing for the public health by establishing an ecologically based mosquito management program in the Commonwealth* (Representative Gouveia/Senator Hinds). This approach would enhance coordination around mosquito management (including education, source reduction, and habitat restoration) within the Commonwealth while permitting home rule over toxic pesticide use. We urge the MCTF to address the deficiencies within the Report and the Commonwealth's current management approach by using H.937/S.556 as the basis for policy recommendations to Massachusetts lawmakers.

Sincerely,

Beyond Pesticides

Community Action Works Campaigns

Conservation Law Foundation

LEAD for Pollinators

Jones River Watershed Association

Massachusetts Association of Conservation Commissions

Massachusetts Sierra Club

NOFA/Mass

Mass Audubon
Policy & Advocacy Team
208 South Great Road, Lincoln, MA 01773
781.259.2172 hricci@massaudubon.org

September 17, 2021

Mosquito Control for the Twenty-First Century Task Force (MC21CTF)
Beth Card, Undersecretary of Environmental Policy and Climate Resilience
Executive Office of Energy and Environmental Affairs
100 Cambridge St.
Suite 900
Boston, MA 02114

Re: **Consultant's Report on Mosquito Control**

Dear Ms. Card and Fellow Members of the Task Force:

On behalf of Mass Audubon, I submit the following comments on the report prepared by a consultant, Energy Research Group (ERG). This report was commissioned by the Executive Office of Energy and Environmental affairs (EEA), pursuant to Chapter 120 of the Acts of 2020, "*An Act to Mitigate Arbovirus in the Commonwealth*" (the Act), the law that also established the MC21CTF[1] We appreciate the opportunity to participate on the MC21CTF and to provide comments on the report.

These comments are divided into **1. corrections** on the report and **2. comments** on mosquito control based on the report and other information. I have consulted with Mass Audubon's Conservation Science staff and several external experts in conducting my review of the report.

According to the Act, the report was intended to be a comprehensive evaluation of current mosquito control practices in Massachusetts. "*The evaluation shall determine the effectiveness of any spraying by examining the impact of the spraying on arbovirus diseases, the cost-effectiveness of the spraying, the impact of spraying on the environment, agriculture and wildlife and other factors.*"

Summary Comment:

The report includes a compilation of available information about mosquito control programs and practices in Massachusetts, and identifies significant gaps in that need to be addressed. These include gaps in record keeping and analysis, discrepancies between best available industry standards and science vs. actual practice, and lack of information about the impacts of mosquito control practices on human health and the environment. It confirms that significant reforms are needed to bring the program into the 21st Century. It also confirms that the program is fragmented and inconsistent. The focus for reform should be on protecting human health and the environment, based on science and with systems established to monitor efficacy and cost-effectiveness. The rights individuals and communities to avoid undesired exposures to toxic chemicals must also be respected.

[1] Note: The report abbreviates the task force as MCTF, but the full title is important, as the legislature specifically formed the task force to bring this antiquated program into the Twenty-First Century. Therefore I use the acronym MC21CTF.

The report concluded that there is no quantifiable data available on the effectiveness of mosquito control as currently practiced (p.184), as well as significant gaps in science and an inability of the consultant to conduct a quantifiable analysis of the impacts of mosquito control pesticides on human health (p.138) or on the environment and ecological health (p.301). Despite this, Section 8 of the report attempts to create a model of potential mosquito-borne disease impacts that would be associated with curtailing or discontinuing current practices. This model lacks scientific rigor and is based on fundamentally flawed assumptions. It should not be given any weight in considering recommendations for the future of the program.

1. **Corrections and Omissions**

Title and Introduction: The report is entitled "Mosquito Control Task Force Report," but it was not produced by the task force. It would more correctly be entitled something like "Consultant Report to the MC21CTF." The introductory paragraphs at the beginning of the report do not accurately characterize the process by which it was produced. This introduction correctly states that the Act calls for the task for to commission an independent expert study. However, the task force actually had a limited role and the production of the report was coordinated between the consultant and the agencies directly. The MC21CTF provided input to EEA on the scope for the Request for Proposals that was issued through the State's procurement system, and reviewed the sole bid that was received in relation to the bid criteria. The task force had no opportunity to review and provide feedback on report drafts, although the state agencies did. It is unclear whether this internal agency review also included opportunities for the mosquito districts to review and provide comments on the draft report. In any case, the report is not a product of the MC21CTF, and the task force did not "commission" the study as stated in the introduction.

Ecotoxicology and Human Health Expertise and Assessment: The MC21CTF voted to approve the bid, on the condition that EEA would negotiate with ERG to ensure that the necessary expertise on ecotoxicology and human health effects of pesticides would be included on the consultant team. When the report was presented to the task force on 9/2/21, the task force was informed that those additions to the team had not occurred as originally planned, but that ERG had attempted to cover these subjects through consultation with other, unidentified experts. The lack of this expertise on the consultant team is, unfortunately, reflected in those portions of the report.

The RFP included:

- *Research, analyze, and report on the quantifiable impact of chemical-based mosquito control aerial and ground-based spraying in Massachusetts.*
    - *When determining quantifiable impacts, report must account for, but is not limited to: Public health; Human health; Medical; Agricultural land including organic farms, Farm animals; Apiaries; Commerce; Recreation; Tourism; Drinking water sources including groundwater and surface water, and with consideration of established exclusion buffer zones around active public water system reservoirs and/or inlets during aerial spraying events; Ecological health including aquatic ecosystems; Native wildlife species including, but not limited to, birds, invertebrates (e.g. bees, odonates, lepidoptera, beetles, sensitive aquatic invertebrates), fish, and other pollinators and mosquito predators.*[2]

The report, in Sections 4, acknowledged that there is literature indicating potential human health impacts of mosquito control pesticides that are still under study by the EPA and others. Section 4 also summaries toxicity categorization of mosquito control pesticides, Sections 4 and 8 note that the pyrethroid pesticides in particular are highly toxic to a wide range of organisms. These include

[2] Request for Proposals: Mosquito Control Task Force Study. The Executive Office of Energy and Environmental Affairs seeks applicants to conduct a study that evaluate the Massachusetts mosquito control process. BD-21-1042-ENV-ENV01-58054. ENV 21 POL 03

pollinators like bees (including hundreds of species of native bees), beetles, flies, and moths, as well as fish and aquatic invertebrates. They are also highly toxic to other beneficial organisms like parasitic wasps and tachnid flies that keep agricultural and forestry pests in check. But there have been few studies on the ecological effects of these pesticides, so little is understood about the impacts, particularly of repeated exposures from routine roadside mosquito spraying operations alone or in combination with other pesticide applications that occur. Table 5-8 in Section 4 indicates no wildlife endocrine or ecotoxicological concerns reported by government agencies for most of the pesticides used in mosquito control. **Absence of data does not mean absence of impact. This should be noted in the corrections/errata section of comments on the report.**

Government agencies are not the only source of scientific information on these aspects of the scoped review. There is a good deal of evidence of impacts and the need for further studies in several of the references cited in the report, but that information is not well summarized in the report. Further commentary on this is provided in the Comments section below.

There has been a persistent failure by Massachusetts to study the ecological and human health impacts of mosquito control practices, despite many requests over the past several decades by many organizations and individuals.

2. Comments

Lack of Efficacy and Noncompliance with IPM Standards

The report confirms that there is no centralized system for tracking the activities of the mosquito districts. Data on mosquito populations, positive disease detections, breeding source locations, and mosquito control services conducted (education, source reduction, larvaciding, adulticiding) cannot be correlated to each other or to the locations of the rare occurrences of EEE or WNV is humans or other animals. Therefore it is not possible to determine the efficacy of their operations. The districts claim to employ Integrated Pest Management (IPM), but the lack of a systematic approach indicates it is not a science-based IPM system.

"While all 11 MCDs, along with other state agencies, participate in larval and adult mosquito surveillance efforts, there is a lack of detailed reporting on their specific IPM activities. Expenditures for each component of IPM are presented in Sections 3.1.2.1 and 3.1.2.2. To date, quantitative assessments of IPM's efficacy at reducing mosquito populations in Massachusetts (both nuisance and vector mosquitoes) and the human health risks from vector mosquitoes have not been undertaken (EEA, personal communication, July 2021)." p. 184

See also Table 3-1 on pp. 238-240. Several aspects of IPM standards recommended by the American Mosquito Control Association are not followed.

Practices vary across districts. Cape Cod has a relatively sophisticated and rigorous approach, and works extensively with local officials including conservation commissions on water management in both salt marshes and fresh water settings. Some of these practices can be ecologically beneficial, e.g. helping to reduce the impacts of sea level rise on salt marshes and enhancing fish access to salt marshes and freshwater wetlands. This district rarely uses adulticides and only in conjunction with positive mosquitoes and high risk of disease in specific locations. While we do not endorse all of these practices (e.g. Bti for nuisance control due to literature data on ecological effects), the overall direction the program should be heading is one that is more ecologically based and data driven.

Some of the districts routinely spray adulticides from trucks even when there is no evidence of mosquito-borne disease. This appears to be contrary to the pesticide labels, e.g. this from the Duet label:

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply to or allow drift onto blooming crops or weeds when bees are foraging in 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[3].

The report also notes this label requirement, and suggests that applicators should be informed when blooming plants are present in their areas. Anyone with a basic understanding of Massachusetts ecosystems knows that blooming plants are widely occurring across the state from early spring through the first hard frosts in the fall. Many plants that commonly grow along roadsides and in yards and meadows produce blooms that attract pollinators. According to Table 5-6, the half-life of pyrethroid pesticides carrying this label warning range from 2.1 to 6.7 days. Therefore, any roadside spraying that is occurring absent any evidence of presence of mosquito-borne disease in the vicinity appears to be a violation of the label.

Nontarget Impacts

The analyses of impacts of pesticides on vulnerable populations, pollinators, and ecological health are incomplete.

Beyond the label requirements, the pyrethroid pesticides are also highly toxic to thousands of native beneficial species Many of native pollinators rest at night on plants in the field (e.g. wild bees, beetles). Moths fly at night and are likely to be directly exposed to spray. Available literature also indicates concerns about potential impacts to vertebrates including fish, birds, and amphibians[4]

Parasitic wasps and flies that keep agricultural and forest pests in check are highly vulnerable to these pesticides as well but are not addressed in the report.

The analysis of impacts to bats is unscientific. It says impacts on bats are unlikely because mosquitoes are a small part of their food supply – but the pesticides are toxic to many of the other flying insects that bats eat too[5]. There is a lawsuit in Vermont on the risks of mosquito control pesticides to endangered bats[6]. Similar conclusions on fish and birds are also flawed.

The report cites several studies and literature review summary reports on human health and ecological impacts of mosquito control pesticides, including both larvacides and pesticides. See, for example these:

Mazzacano, C., & Black, S. H. (2013). *Ecologically Sound Mosquito Management in Wetlands: An Overview of Mosquito Control Practices, the Risks, Benefits, and Nontarget Impacts, and Recommendations on Effective Practices that Control Mosquitoes, Reduce Pesticide Use, and Protect Wetlands*. The Xerces Society for Invertebrate Conservation.

Utah Physicians for a Healthy Environment. (2019). *Mosquito Pesticide Spraying*. Retrieved June 22, 2021 from https://www.uphe.org/priority-issues/mosquito-pesticide-spraying/

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[3] https://www.clarke.com/filebin/productpdf/duet.pdf

[4] E. Török et al, *Unmeasured Side Effects Of Mosquito Control On Biodiversity,* European Journal of Ecology, 6.1 (71-76), 2020.

[5] https://www.burlingtonfreepress.com/story/news/2021/08/17/environmental-groups-sue-vermont-agency-failing-protect-bats/8161620002/

[6] https://www.burlingtonfreepress.com/story/news/2021/08/17/environmental-groups-sue-vermont-agency-failing-protect-bats/8161620002/

City of Boulder. (2018). *Review of the Scientific Literature for Impacts of Bacillus thuringiensis sub-species israelensis (Bti) for Mosquito Control*.

The inclusion of these sources and brief summaries of some of the findings are useful. However, we had expected a more rigorous review of this topic in relation to actual practices in Massachusetts. The lack of data on what practices are actually being applied and where, combined with the limited time available to the consultant and lack of ecological expertise on the consultant team resulted in a cursory review that did not fulfill the intention of this portion of the law on the comprehensive study.

Effects of Reducing or Eliminating Mosquito Control

The modeling of projected WNV and EEE cases if mosquito control was discontinued is deeply flawed. Section 8 of the report uses information on the range of percentages of mosquitoes temporarily eliminated by larviciding or adulticiding, then uses that as a proxy for reduction in number of cases of EEE or WNV. There is no basis for this proxy assumption. Reducing mosquitoes by, for example, 50% does not necessarily reduce the number of disease cases by 50%. Other factors such as whether or not people take precautions to prevent exposure to mosquito bites may have more of an effect on outcomes. Since these diseases are extremely rare (0.3 cases per million people per year for EEE, 1.6 for WNV), and mosquito populations are so large and prevalent, even reducing the mosquito population by 50% still means there are millions of mosquitoes present. The Department of Public Health's Arbovirus Surveillance and Response Plan emphasizes that personal protection measures are the first line of defense, and must always be taken even after aerial or ground spraying has taken place.

Ecologically Based Mosquito Management

The sections on stormwater management and on dam removals and culvert upgrades are not complete. Piped stormwater systems with catch basins create prime habitat for the mosquitoes that carry WNV. Rain gardens and bioswales do not create mosquito habitat if properly built and maintained. More cooperative efforts should be put into updating municipal rules for stormwater management to emphasize Low Impact Development techniques that do not create mosquito habitat.

Dam removals and culvert upgrades not only remove ponded stagnant water – they allow fish and eels to get into headwaters. Restoring eel[7] access to headwater wooded swamps could reduce the mosquitoes that amplify EEE. Those mosquitoes breed in "crypts" under tree roots in swamps. Even aerial Bti can't reach those crypts, but eels can.

Opt Outs

Municipalities and landowners should be able to opt-out from pesticide treatments they do not want, while having access to services such as surveillance, education, and ecologically based source control.

The current system for landowner opt outs is cumbersome and should be streamlined, including an easy electronic method for annual renewal.

Opt-outs for organic farms should not be limited to certified organic farms. Mass Audubon's Drumlin Farm employs sustainable farming practices that exceed organic standards, but the farm has not undergone the certification process. Income from crops at Drumlin Farm exceed $450,000 annually and sales to customers including farmers markets, restaurants, and our Community Supported Agriculture members would be jeopardized if the farm were forced to endure pesticide spraying.

[7] https://www.youtube.com/watch?v=GpPpBwZ_s8A

Conclusion

Mass Audubon looks forward to working with the task force and state government to update and refocus the program on public health and ecological management. There should be an emphasis on prioritizing public education, source control, and wetlands/river restoration.

Sincerely,

E. Heidi Ricci

E. Heidi Ricci
Director of Policy and Advocacy

September 16, 2021

To the members of the Mosquito Control Task Force,

I am a resident of Massachusetts. I am also a small-scale farmer, growing fruit, vegetables, and grains using organic practices, and I grow native plants as insect habitat. I am alarmed by the use of pesticides to manage mosquitoes, and request that the Task Force develop an ecological mosquito management policy that prioritizes preventative measures.

Such a policy should include: monitoring, public education and personal protective measures, emphasis on eliminating breeding sites, consideration of local ecology, and a tiered approach to management. This would start with habitat manipulation (e.g. dam removal to allow fish to re-enter habitat, restoring flow/ infiltration to stagnant roadside ditches, cleaning up tire dumps), followed by larvicide applications if monitoring indicates necessity based on pre-defined thresholds, and finally, aldulticide as a last resort during public health emergencies with significant threat based on pre-defined thresholds, after all other methods have been attempted and found ineffective.

Ongoing studies should evaluate whether pesticide applications actually reduce the incidence of arbovirus in humans, and the program should be adapted accordingly.

Adulticide should never be employed on nuisance mosquito populations, and aerial spraying should never be employed under any circumstance. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases. The public must be notified of mosquito control measures—larvicide or adulticide use, including full disclosure of the pesticide ingredients, location, date, time, and reason for treatment (i.e. results of recent testing and relation to preset thresholds).

I have been alarmed by the representation that spraying for adult mosquitoes in the evening will avoid "pollinators". Not only do pollinators continue to exist in the landscape and be vulnerable to pesticides even when they aren't actively flying, but there are countless other insects important to biodiversity that are not pollinators, and are also vulnerable to pesticides at any time of day or night. Even the idea that larvicides are specific to mosquitoes is flawed; they kill the larvae of all kinds of flies that are food for birds, bats, dragonflies, and other insectivores.

Living during a pandemic has underscored the truth that public health is a community-wide education effort, rather than something that can be imposed from above. There are many risks in life; arbovirus is a serious one, and so is living in a world with broad-scale pesticide use, which can increase risk factors to human immune and respiratory systems, and has linkages with Parkinson's Disease and other neurological disorders. Although mosquito control is just one instance of pesticide exposure, it is one that we can feel powerless to avoid when imposed upon whole regions with little opportunity for localities or individuals to successfully opt out.

As a small scale producer, not certified organic, I am concerned that my opt-out request may not be honored. I work hard to grow food organically, and hope I might continue to offer food that I can be certain is free of pesticides to my family and neighbors.

I hope the new policy will apply across the state, ensuring that Mosquito Control Districts abide by wetland regulations and share transparent, predetermined thresholds for treatment, and offer individual communities the opportunity to choose to emphasize measures that preclude pesticide use.

I'm excited for Massachusetts to take the lead in demonstrating how to successfully manage mosquito-borne illness with little to no pesticide use; I will be one among many residents watching closely to ensure this opportunity is not missed.

Thank you for your attention to this matter,

Julia Blyth
276 Old Wendell Rd.
Northfield, MA 01360

To whom it may concern:

The Task Force for the 21st Century will discuss the future of Mosquito control in Massachusetts. I would like to add my comments regarding the following:

Regarding Mosquito Control Practices in Massachusetts:

Adulticide and larvicide spraying by truck or by plane should only be used throughout the state in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.

If aerial spraying is practiced in Massachusetts, drift calculations must be considered and the results used to determine safe aerial practices. Communication regarding spraying needs to be as wide spread, varied and detailed with links to appropriate, accurate and timely information to allow persons impacted to plan to be out of the area.

Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency.

Accurate drift calculations must be calculated and communicated to protect opted out property.

Massachusetts must legislate stricter regulation of private pesticide use.

All ingredients, including inert ingredients, for products sold in Massachusetts must be required disclosures.

Regarding Municipal Opt Out Policy:

There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should request being opted in on an annual basis requiring local Boards of Health and the public to consider the current conditions in their municipality. Town Meeting and City Councils should be ready to address the annual assessment of their community's needs.

Municipalities need to be provided clear guidelines regarding criteria for approval in the opt out process. Guidelines regarding the criteria for approval must be published with sufficient time in advance for towns to plan and budget accordingly.

September 17, 2021

Mosquito Control for the Twenty-First Century Task Force
Executive Office of Energy and Environmental Affairs
100 Cambridge St.
Suite 900
Boston, MA 02114

Dear Members of the Mosquito Control for the Twenty-First Century Task Force,

Thank you for the opportunity to provide comments on the Mosquito Control Task Force (MCTF) Report (hereinafter the "Report"). After reviewing the Report, Public Employees for Environmental Responsibility (PEER) believes three things are abundantly clear: 1) the Report is profoundly flawed; 2) there is not enough evidence to conclude that larviciding and adulticiding are effective at reducing the incidence of West Nile Virus (WNV) or Eastern Equine Encephalitis (EEE); and 3) the human health and environmental effects of such larviciding and adulticiding are of grave concern. As such, Massachusetts' current mosquito control program must be radically transformed in order to protect both human and health and the environment of the Commonwealth. Our specific comments are set forth below.

The risk of WNV and EEE is miniscule, and as such, can be addressed through less harmful means. According to the Report, the average "annual risk of EEE across Massachusetts from 2000 to 2020 is 0.3 cases per million residents, and the range of risk across individual counties is 0 to 2.7 cases per million residents."[1] Specifically, there have been 114 cases of human EEE cases and 63 deaths in the past 82 years.[2] Moreover, even these data regarding the number of cases are likely skewed. As the Report acknowledges:

> …cases are indexed by the individual's county of residence and may not represent the location where the person became infected. It is possible that individuals were infected in other parts of the state, or even out of state, but were recorded as cases in their home counties. Further, the low total case counts and low populations of several Massachusetts

[1] Mosquito Control Task Force Report at 20
[2] Id. at 21

counties can create artifacts in the data that may or may not provide an accurate picture of risk.[3]

Given the toxicity of the pesticides used, which are discussed in more detail below, it is unfathomable that the Commonwealth is spraying millions of acres of the state to combat such a small risk, especially when adjusting human behavior is the most effective way of preventing disease.

The Report's reliance on "interviews" is unscientific and cannot be used as a basis for evaluating the current mosquito control program. Eastern Research Group (ERG), the consultant hired to write the Report, conducted 18 interviews with 21 respondents in order to "understand the effectiveness" of the Commonwealth's "policy and decision-making structure."[4] ERG interviewed Massachusetts state agency staff, Mosquito Control District (MCD) superintendents, MCD commissioners, local board of health representatives, MCTF members, environmental nonprofit representatives, and mosquito control experts from other states. However, nowhere did ERG disclose the precise affiliations of those 21 respondents. This failure makes it impossible to determine any bias that may be inherent in the responses to the interview questions.

For example, the Report states that, "more than half of respondents praised certain elements of the current policy structure…Respondents' primary suggestion was to increase membership in MCDs across the Commonwealth and improve cohesiveness of control efforts."[5] If more than half the Respondents are from MCDs or mosquito control experts, it is inevitable that they would praise the current policy structure. All surveys will be biased – indeed, if ERG interviewed more environmental non-profits than MCDs, the data may be skewed the other direction – but other than acknowledging that this bias exists,[6] ERG did nothing to disclose possible bias, or eliminate it. The interview data is therefore invalid; at the very least, the Report should have disclosed the affiliations of all 21 Respondents.

The Report contains errata and ignores relevant peer-reviewed studies. As PEER pointed out at the hearing where the Report was discussed with the MCTF, there are critical errors, such as listing piperonyl butoxide (PBO) as "not likely to be carcinogenic"[7] when the U.S. Environmental Protection Agency (EPA) considers PBO to be a possible human carcinogen.

The Report also ignores relevant peer-reviewed science. Table 5.7[8] (see below) states that the toxicity of Bti to invertebrates and birds is "Practically nontoxic," and the toxicity of pyrethroids to birds is "Generally not expected."

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[3] Id
[4] Id. at 34
[5] Id. at 51
[6] Id. at 50
[7] Id. at 134
[8] Id. at 145

Table 5-7. Summary of Acute Toxicity Classifications for Active Ingredients Used by MCDs and the SRB in Mosquito Control

Active Ingredient	Freshwater Fish	Freshwater Invertebrates	Estuarine/Marine Fish	Estuarine/Marine Invertebrates	Birds	Non-target Insects
Bti	Practically nontoxic to slightly toxic	Moderately toxic	Practically nontoxic	Practically nontoxic	Practically nontoxic	Practically nontoxic
Bs[a]	Practically nontoxic	Practically nontoxic	Practically nontoxic	Practically nontoxic	Practically nontoxic	Practically nontoxic
Spinosad	Moderately toxic	Slightly toxic	Moderately toxic	Highly toxic	Low toxicity with acute exposure, more sensitive with chronic exposure[b]	Highly toxic
Methoprene	Moderately to highly toxic[b]	Highly toxic	Data not presented	Very highly toxic	Practically nontoxic	Data not presented
Mineral oil	Practically nontoxic	Highly toxic	Not toxic	Moderately toxic	Practically nontoxic	Practically nontoxic
Pyrethroids[c]	Very highly toxic	Very highly toxic	Very highly toxic	Very highly toxic	Generally not expected[b]	Highly toxic

[a] Given the similar biochemical profile to AM614's, EPA assumed AM614 is likely also nontoxic in the environment.
[b] EPA's rationale documentation did not classify the impacts following the standard categorization. The range exists due to different LD_{50} values for different fish species (USEPA, 2019a).
[c] The categorizations in this table are based on the pyrethroid category, not individual pyrethroid compounds. This is because, in the most recent evaluation of data for registration of 19 pyrethroids, EPA focused on nine specific compounds (bifenthrin, cyfluthrins, cyhalothrins, cypermethrins, deltamethrin, esfenvalerate, fenpropathrin, permethrin, and the pyrethrins) and provide rationale that all 19 pyrethroids did not need to go through full risk evaluations.

However, a cursory search of peer-reviewed literature shows that Bti:

> …may have more side effects on the food web than usually acknowledged…. Bti can decrease chironomid abundances and thereby threaten the reproduction of many vertebrate species, especially in spring when chironomid midges represent their key food resource… may subsequently lead to unwanted indirect negative effects for birds, bats, and other aquatic organisms feeding on them…[9]

The authors of this recent study conclude that "[i]ntensive mosquito control programs are likely to contribute to insect diversity loss, but these effects are both underestimated and understudied."[10] Moreover, another 2020 scientific paper concludes that permethrin has "negative effects on finch breeding success."[11] Yet another paper describes finding pyrethroids in 93% of wild bird eggs, suggesting that toxicological effects need to be studied.[12] Finally, other researchers found that Bti resulted in significantly lower bird clutch size and fledgling survival.[13]

While these peer-reviewed articles are not exhaustive, it indicates that there is independent, peer-reviewed research that the Report should have included, and did not. It is abundantly clear that ERG should not have relied primarily on EPA data to assess the toxicity of these insecticides.

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[9] E. Török et al, *Unmeasured Side Effects Of Mosquito Control On Biodiversity,* European Journal of Ecology, 6.1 (71-76), 2020

[10] Id.

[11] Bulgarella, M. et al. *Sub-lethal effects of permethrin exposure on a passerine: implications for managing ectoparasites in wild bird nests,* Conservation Physiology, Volume 8 (2020).

[12] Corcellas, C. et al., *Pyrethroid insecticides in wild bird eggs from a World Heritage Listed Park: A case study in Doñana National Park (Spain)*, Envir. Pollution, 228 (321-330) 2017

[13] Poulin, B., G. Lefebvre, and L. Paz, *Red flag for green spray: adverse trophic effects of Bti on breeding birds*, J. of Applied Ecology, Vol. 47(4), 884-889, 2010

PFAS in pesticides is of critical concern and should have been given more attention. As you are aware, PEER discovered per-and polyfluoroalkyl substances (PFAS) in Anvil 10+10, and brought it to the attention of Massachusetts Department of Environmental Protection (MADEP) and EPA. The Report states that, "…PFAS… have been detected in pesticide products used in Massachusetts for mosquito control. EPA identified the source of the contamination to be from the containers in which the product is packaged. However, there is some debate as to whether other pesticides contain PFAS through the products ingredients. EPA and EEA are continuing to work on this ongoing issue."[14] While PEER appreciates the work that MADEP has put into this issue, it is clear that the PFAS is not always from fluorinated containers, as EPA is alleging. It is imperative that the Commonwealth ensure that there is no PFAS in any pesticide product used in the state. Specifically, Table 4-2 shows that since 2010, more than 3 million acres of the Commonwealth have been sprayed with more than 14,000 gallons of Anvil 10+10.[15] Given the toxicity, persistence, and bioaccumulation of PFAS, we cannot afford to have any PFAS in pesticides.

Toxicity of pyrethroids was given short shrift in the Report. The Report discusses how permethrin has been reclassified under the Trump Administration as "suggestive evidence of carcinogenic potential" by the oral route. However, the Report neglects to mention that permethrin was previously classified permethrin as "Likely to be Carcinogenic to Humans" by the oral route.[16] Recent disclosures have revealed how EPA has been downplaying the risks of pesticides,[17] and it is obvious that EPA's reclassifications cannot be trusted.

In addition, recent independent research shows that permethrin is highly toxic. For example, one scientific study from 2020 states:

> …despite the extremely wide application of pyrethroids, there are many problems, such as insecticide resistance, lethal/sub-lethal toxicity to mammals, aquatic organisms or other beneficial organisms…its toxic effects on non-target organisms should be also considered. Pyrethroid resistance is present not only in insect mosquitoes but also in environmental microorganisms, which results in anti-pyrethroids resistance (APR) strains. Besides, photodegradation product dibenzofurans is harmful to mammals and environment. Additionally, pyrethroid metabolites may have higher hormonal interference than the parents. Particularly, delivery of pyrethroids in nanoform can reduce the discharge of more toxic substances (such as organic solvents, etc.) to the environment.[18]

Perhaps the most comprehensive scientific report on pyrethroids was entirely ignored by the Report. This review states:

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[14] Report at 112
[15] Id. at 114
[16] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-109701_1-Aug-09.pdf
[17] https://theintercept.com/2021/06/30/epa-pesticides-exposure-opp/
[18] Zhu, Q., et al, *Synthesis, insecticidal activity, resistance, photodegradation and toxicity of pyrethroids (A review)*, Chemosphere, Volume 254, 2020

> …these products are far from harmless to human health, and that every insecticide must be used with great caution. As these are commonly used products that are labeled safe for human use, thorough studies highlighting the long-term physical, neurodevelopmental, neurobehavioral, reproductive and cancer related dangers these pyrethroids pose to both low and high risk (high users) population groups are needed.[19]

PEER believes it is inappropriate to rely on EPA's risk assessments – which are suspect – and the Report should have done a more comprehensive literature search for the toxicity of pyrethroids. Indeed, the Report concedes that:

> There are also unknown ecological and human health risks that EPA is not evaluating. Not all ingredients in pesticide products are known, because companies protect their product formulations. Meanwhile, compounds may enter the products from containers, as demonstrated with the new issue related to PFAS. Ultimately, pesticides must be used with caution and consideration to the tradeoffs—for example, the need to remove mosquitoes active at nuisance levels versus the ecological risk that may occur as a result of the application.[20]

The Report also concedes that "pyrethroids are considered highly toxic to honey bees based on the low doses that can result in death…EPA's risk assessment for pyrethroids only assessed the risk to pollinators due to agricultural uses, not adulticiding, making this a potential exposure route that has not been evaluated by EPA."[21] Despite these acknowledgments that EPA is not evaluating all risks, the Report concludes:

> The U.S. Environmental Protection Agency (EPA) reviews all commercially available pesticides and approves their use for specific pests and end uses. Pesticide label instructions provide applicators with instructions for appropriate use and restrictions, which are ***generally protective*** of non-target receptors and must be followed according to federal law…Current practices in Massachusetts include several protective activities and mechanisms to confirm protective measures are being followed (emphasis added).[22]

PEER maintains that neither the labels nor current practices in Massachusetts are "generally protective" of human health or the environment. The Report should have included more independent research on the toxicity and effects of these pesticides. The research ERG did use was insufficient. Specifically, the Report states:

> In addition to reviewing EPA's information on these ingredients, ERG reviewed (Saillenfait et al., 2015)'s (sic) comprehensive literature review on pyrethroids and human health impacts. The authors state that the evidence of various health effects from low-level chronic exposure to pyrethroids is "limited and controversial" (Saillenfait et al., 2015). The epidemiological studies reviewed observed potential associations between

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[19] Chrustek A, Hołyńska-Iwan I, Dziembowska I, et al. Current Research on the Safety of Pyrethroids Used as Insecticides. *Medicina (Kaunas)*. 2018;54(4):61. Published 2018 Aug 28. doi:10.3390/medicina54040061
[20] Report at 159
[21] Id. at 149
[22] Id. at 236

> pyrethroid exposure and sperm quality, sperm DNA, reproductive hormones, pregnancy outcomes, and neurobehavioral outcomes (e.g., attention-deficit/hyperactivity disorder) after in utero exposure [citations omitted]. However, the authors also note that these findings are inconclusive, and that further research is needed to determine the potential risks associated with long-term, low-level exposure to pyrethroids.[23]

ERG should have included the more recent studies mentioned above, and others.

Data regarding the half-life of pesticides is misleading. The Report correctly states that EPA's "ecological risk assessment, which focuses on aquatic toxicity, demonstrated that concentrations exceeding levels of concern may be present after application of pyrethroids for a variety of uses, including aerial spraying events to control mosquitoes."[24] Table 5-6,[25] reproduced below, shows the half-lives of various pesticides and their synergists.

Table 5-6. Summary of Physical/Chemical Property Information

Chemical	CASRN	$\log K_{ow}$	BCF	BAF	Half-Life (Days) in Various Systems				
					Biotransformation in Fish (kM)	"Typical" Soil[a]	Water with Sediment	Water Only	On Plant Surfaces
Larvicides									
Bti	68038-71-1	—	—	—	—	120[b]	—	—	1–4[b]
Bs ABTS 1743	143447-72-7	—	—	—	—	—	—	—	—
Bs AM614	143447-72-7	—	—	—	—	—	—	—	—
Spinosyn A	131929-60-7	3.9	10.5	—	1.16	24.3	126	16	2–16
Spinosyn D	131929-63-0	4.3	27.4	—	1.17	45.2	126	11	2–16
Mineral oil	8012-95-1	12.3	—	—	—	65	—	—	—
White mineral oil	8042-47-5	5	—	—	—	87	—	—	—
Methoprene	40596-69-8	5	143	—	0.955	10	1–28[c]		1.4[d]
Adulticides									
d-phenothrin	26002-80-2	6.01	475	355	2.68	1–2	—	—	6.0
Etofenprox	80844-07-1	6.9	3,900	137,000	3.51	11	13.3	5.7	2.1[d]
Deltamethrin	52918-63-5	4.6	415	1,760	3.23	58.2	65	17	6.5
Fluvalinate	69409-94-5	3.85	3,810	664	4.68	7	—	—	3.0
Prallethrin	23031-36-9	4.49	45.9	86.2	0.256	—	—	—	—
Permethrin	52645-53-1	6.1	563	1,060	2.34	13	40	23	6.7
PBO	51-03-6	4.75	105	249	4.19	13		<1[e]	14.3

— = data not available
[a] IUPAC uses "typical" to describe soils that are "given in the general literature and are often a mean of all studies field and laboratory" (Lewis et al., 2016).
[b] Data are from the USEPA Registration document for Bti (USEPA, 1999)
[c] The data source for this value, the National Pesticide Information Center, did not indicate the water system from which these values were collated.
[d] Data were not available for on plant surfaces only. This value indicates on *and in* plant matrices
[e] This value is reported as "in an aqueous solution when illuminated with sunlight."

Accompanying text in the Report states:

> Adulticides, which are to be sprayed in the air and avoid water bodies, have data indicating half-lives in water and soil of less than a month in most cases. The exception to this is deltamethrin, which has a half-life in soil of about two months. All the adulticides except for PBO have half-lives on plants of less than one week. PBO, the synergist used in some pyrethroid formulations, may take more than two weeks to degrade to half its original amount.[26]

[23] Id. at 292
[24] Id. at 148
[25] Id. at 143
[26] Id. at 144

However, in the Report's discussion about the persistence of these chemicals and their toxicity, they neglect to mention that because aerial spraying is allegedly only effective for two weeks,[27] and because of ground spraying, home misters, and aerial spraying, it is likely that some areas around the Commonwealth have an almost constant application of these pesticides. Therefore, the half-life of these toxins is meaningless, as re-application will result in an almost constant presence during mosquito season.

Finally, the EPA does not consider the toxicity and half-life of degradation products. For example, fluvalinate is a polyfluorianted organohalogen and likely has degradation products with long half-lives if not "forever".

Efficacy of aerial spraying on disease reduction is impossible to determine, and therefore cannot be used in forecasting impacts of eliminating aerial spraying. Perhaps the most troubling section of the Report is the reliance on and use of spray efficacy "data." First, the Report states that, "the total reduction in the number of mosquitoes can range significantly—from 20 to 89 percent—after aerial spraying with pyrethroid compounds. But this reduction is expected to be temporary."[28] Table 8-1,[29] reproduced below, shows the ranges of efficacy of overall mosquito mortality.

Table 8-1. Aerial Spray Efficacy: Percent Reduction in Mosquitoes Trapped

Aerial Intervention Location	Start Date	End Date	Total Reduction in Primary Mosquito Vector[a,b]	Total Reduction in Mosquitoes Trapped	Temperature Range (°F)[c]	Dewpoint Range (°F)[c]	Acres per Hour (Average Across All Hours of Spray)
Bristol/Plymouth	8/8/2006	8/9/2006	35–92%	59–86%	59–64	53–57	17,499
Bristol/Plymouth	8/22/2006	8/24/2006	0–94%	60–89%	57–69	55–62	34,191
Bristol/Plymouth	8/5/2010	8/7/2010	87–89%	77–87%	58–79	57–73	26,194
Bristol/Plymouth	7/20/2012	7/22/2012	14–84%	42–81%	56–73	54–61	30,701
Bristol/Plymouth	8/13/2012	8/14/2006	46–60%	36–47%	66–73	64–66	21,981
Bristol/Plymouth	8/8/2019	8/11/2019	66%	58%	55–72	50–70	20,112
Bristol/Plymouth	8/21/2019	8/25/2019	91%	25%	57–77	51–74	15,066
Middlesex/Worcester	8/26/2019	8/27/2019	38%	20%	53–64	45–57	16,212
Middlesex/Norfolk/Worcester	9/10/2019	9/18/2019	—	—	52–70	42–69	16,975
Hampden/Hampshire/Worcester	9/16/2019	9/17/2019	—	—	48–58	47–51	14,388
Bristol/Plymouth	9/18/2019	9/24/2019	—	53%	54–70	51–67	12,125
Bristol/Plymouth	8/10/2020	8/11/2020	82%	70%	73-78	68-72	29,833

Source: (Bharel & Cranston, 2021a)

— = control not detected; calculations may be affected by small sample sizes.

[a] Primary mosquito vector is the mammal-biting species *Coquillettidia perturbans*, considered to be the mosquito most likely to spread EEE to humans.

[b] Data sources include DPH and the Bristol and Plymouth County MCDs. 2006–2012 data shown as ranges inclusive of all three data sources. 2019 combines data from all three sources into a single calculation.

[c] Weather data taken from Plymouth, Worcester, and Westover airports and may not accurately represent actual temperature and dewpoint at location of spraying.

[27] Id. at 282

[28] Id. at 157

[29] Id. at 158

In addition, Table 2-2[30] shows the alleged efficacy of larviciding and adulticiding against WNV and EEE.

Table 2-2. Efficacy of Different Mosquito Control Practices Against WNV and EEE

Control Type	Arbovirus	Efficacy Range	Source
Larviciding	EEE	24–76%	(Luo, 2019; Sun et al., 2014)
	WNV		
Adulticiding—ultra-low-volume truck spraying	EEE	26–85%	(Barber et al., 2007)
	WNV		
Adulticiding—aerial spraying	EEE	38–91%	(Bharel & Cranston, 2021b)
	WNV	20–82%	

The Report states that ERG used "the range of the total reduction in mosquitoes trapped after aerial spraying events in 2006, 2010, 2012, and 2019...When the report presented a range, ERG opted to use the average value of the range."[31] However, ERG never discloses if the efficacy data are normally distributed. This is a major assumption; if the data are *not* normally distributed, ERG should have either transformed the data, or used a more appropriate summary statistic (i.e., either the median or some other value).

More importantly, however, is the fact that there is ***no way to assess the efficacy of pesticide application on disease reduction in humans.*** The Commonwealth measures efficacy of each aerial spray by "conducting pre- and post-spray trapping, both in areas not covered by the aerial spray (control traps) and inside the aerial spray zone (treatment traps). The efficacy of a spray event is then assessed by calculating the percent reduction in the mosquito population, using the Henderson-Tilton Formula."[32] The Commonwealth has not been forthcoming in revealing details about this pre- and post-spray testing; in other words, we do not know how many traps they use, where the traps are located (e.g., in the open, in vegetated areas, etc.), or how they deal with mortality versus knockdown. Even if an aerial spray event dramatically reduces the populations of mosquitoes in a particular area, we do not know if the mosquitoes killed were the ones carrying WNV or EEE. Indeed, a 2021 study concludes, "Aerial applications cannot and do not eliminate risk and must not be viewed by the public or municipalities as a solution to EEE risk."[33] ERG used data on the percent reductions in mosquito populations "as a proxy for efficacy in reducing vector-borne infections,"[34] and this is not appropriate. Therefore, ***all*** of the models ERG presented in the Report regarding disease incidence without intervention are meaningless and should be deleted.

In addition, there are other issues with ERG's statistics: ERG states that it used "Monte Carlo quantification to estimate how the number of cases of EEE and WNV will vary under different levels of mosquito control."[35] However, what ERG does not disclose is the distribution models of

[30] Id. at 282
[31] Id.
[32] Bharel, M., & Cranston, K. (2021). Massachusetts Arbovirus Surveillance and Response Plan, p. 16
[33] Id.
[34] Report at 281
[35] Id. at 279

the Monte Carlo model, so it is impossible to assess the validity of their statistics. Other statistical issues include assuming each county is the same, and combining all the years of data. The hard reality is that there are not adequate data to model this, and ERG should not have tried. The phrase "garbage in, garbage out" is appropriate in this case; in other words, poor quality input will always produce faulty output.

Conclusion. The Report is profoundly flawed, is statistically and scientifically unsound, likely skewed by affiliations of respondents to interviews, and fails to address the economic, ecological, and human health impacts of pesticides used in the Commonwealth. Because we have no idea whether spraying reduces the incidence of human disease, PEER urges the MCTF to recognize the shortcomings of this Report and use the precautionary principal to overhaul the Commonwealth's mosquito control program.

Sincerely,

Kyla Bennett

Kyla Bennett, PhD, JD
Science Policy Advisor
Public employees for Environmental Responsibility

It is very widely recognized that the use of pesticides is one of the major causes of declines in the numbers of our insects (bees, beetles, flies) and bats. These are not only the primary pollinators of most of our food crops, but they are also the primary food sources of our native birds. The declines in insect populations are endangering food production for us humans while also causing declines of our bird, frog, amphibian, and fish populations.

While mosquitoes are carriers for some human diseases, they are a major food source for our bats, birds, fish, and amphibians. Our own self-interest should direct us to find more environmentally sound ways to control mosquitoes that do not leave toxic residues in our water and on our plants that poison the very insects and other animal life that we need for our own survival.

I strongly oppose the use of highly toxic pyrethroid pesticides and hope that the State will choose more environmentally safe means of controlling mosquitoes. As an organic gardener myself, I also oppose the spraying of these chemicals which would fall on my garden without my choice.

BERKSHIRE ENVIRONMENTAL ACTION TEAM
20 Chapel St. Pittsfield, MA 01201 • thebeatnews.org
413-464-9402 • team@thebeatnews.org

Protecting the environment for wildlife in support of the natural world that sustains us all.

September 1st, 2021

Mosquito Control Task Force

Re: Mosquito Control Task Force Report

Dear Mosquito Control Task Force,

Please accept the following comments from the Berkshire Environmental Action Team, Inc. (BEAT). BEAT's mission is to protect the environment for wildlife in support of the natural world that sustains us all.

We appreciate the efforts of the Mosquito Control Task Force (MCTF) to put together this comprehensive study.

The study[1] states "Most active ingredients evaluated have properties that indicate a high potential for bioaccumulation. The main toxicological concern for all the products used in Massachusetts is ecological.." (112). This is a major concern for BEAT. We request that if the MCTF is not already doing so, they avoid using mosquito control management (especially larvicides) in or near vernal pools, especially those that are registered with the state's Natural Heritage and Endangered Species Program (NHESP) as certified vernal pools[2] or potential vernal pools[3]. Larvicides, especially *Bacillus thuringiensis israelensis* (Bti) can be harmful for tadpoles even in small concentrations[4]. We are also concerned with the use of Methoprene as it has been found to have non-target effects on pollinators such as butterflies (Lepidoptera spp.)[5] most notably, in addition to other insect taxa.

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[1] https://www.mass.gov/doc/mosquito-control-task-force-report-august-2021/download
[2] https://massgis.maps.arcgis.com/home/item.html?id=dbe5591721504490ba22a2fa8644b774
[3] https://massgis.maps.arcgis.com/home/item.html?id=88d5ba624a3447c7a30c148a6f1692b0
[4] Lajmanovich, Rafael & Junges, Celina & Cabagna, Mariana & Attademo, Andrés & Peltzer, Paola & Maglianese, Mariana & Marquez, Vanina & Beccaria, Alejandro. (2014). Toxicity of Bacillus thuringiensis var. israelensis in aqueous suspension on the South American common frog Leptodactylus latrans (Anura: Leptodactylidae) tadpoles. Environmental Research. 136. 10.1016/j.envres.2014.10.022.
[5] https://www.mass.gov/doc/methoprenereviewfinalver20pdf/download

We appreciate that The State Reclamation and Mosquito Control Board (SRB) currently excludes priority habitats for rare species in mosquito control management. BEAT encourages the MCTF to work closely with wildlife stakeholders to minimize impacts of bioaccumulation and identify areas that should not be managed the protect sensitive wildlife.

Thank you for accepting our comments.

Sincerely,

Noah Henkenius

Noah Henkenius
Stewardship Manager

Summary of Opt-Outs of Wide-Area Pesticide Applications

By Mass. Sierra Club
September 17, 2021

The memo analyzes the individual properties and communities that have requested to opt out of Wide-Area Pesticide Applications.[1] This memo expands upon Chapter 3 of the *Mosquito Control Task Force Report*.

Key findings:

- Opposition to spraying in the form of individual property opt outs has increased year over year. The number has tripled from 2017 to 2021. (See Figure 1.)
- In 2021, individual opt outs are found across the state in nearly every municipality and every type of municipality (urban/rural, high/low EEE rates). The number of communities where opt outs occur also appears to be growing. The rate of opt-outs in a given community range to a high of over 10% of housing units (as shown in Figure 2).
- 37 cities and towns submitted applications to opt out of wide-ware spraying by the state, which represents 10.5% of the 351 communities in the Commonwealth.[2] This includes the two that had submitted applications after the deadline and so were rejected by the state. At least eight more communities publicly discussed submitting an application, for a total of 45 municipalities (13% of all municipalities) in seven counties (see Appendix 1).

These numbers are indicative of significant opposition to wide-area spraying. The actual number of people who are opposed to spraying is much higher since these numbers represent only those property owners with the awareness of the state's spraying program and the resources to access the opt-out system.

Statewide Summary

The Massachusetts Sierra Club made a Public Records Request of the Massachusetts Department of Agricultural Resources (MDAR) of all individual opt outs since 2019. MDAR provided data through July 26, 2021.

Since 2019, there have been over seven thousand requests in total from 330 cities and towns out of the 351 in the Commonwealth. Since addresses were not provided in the data set there is no way of knowing how many were from the same property (although 63

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[1] Properties use this state Web page to request opt-out:
https://www.mass.gov/how-to/how-to-request-an-exclusion-or-opt-out-from-wide-area-pesticide-applications
Note that opt-outs expire at the end of the calendar year.

[2] Eastern Research Group, *Mosquito Control Task Force Report*, p. 91

communities representing 410 properties had only one year with opt outs so those cannot be repeats).

Opposition to spraying in the form of opt outs have increased year over year:

Year	Opt-out Requests	% Annual Increase
2017	1,075	
2018	1,641	53%
2019	1,795	9%
2020	2,349	31%
2021	3,204	36%

Figure 1[3]

And the 2021 data covers just over half the year, although one could presume that few requests have been made since July 26. Forty-nine communities had their first opt out requests in 2021. Both of these facts indicate that opting out has become more of an issue for the public at large. There has been more focus on the issue lately with aerial spraying for EEE in some parts of the state in 2019 and 2020, news articles on spraying including PFAS contamination in pesticides,[4] and with the creation of the Mosquito Task Force.

Higher rates of opt out are seen outside of Southeastern Massachusetts, and likewise for municipal opt-outs under the program instituted in 2021.[5] However, this section of the state includes some counties that are often sprayed with adulticides, as well as some that are not sprayed (the Cape and Islands).

Analysis by County and Community

This analysis augmented the state data with housing unit counts from the 2020 Census. This serves as a proxy for the number of properties, data which was not readily available. This should be fairly accurate for municipalities with low percentages of multi-unit housing. Note that opt-out rates are *not* correlated with the number of housing units (r=0.1), which is not surprising. There appears to be some negative correlation with density.

There were opt outs in every county, but the rates were very low in Suffolk, and the Cape and Islands, where wide-area spraying does not generally occur. The highest opt-out rates were in Franklin and Hampshire (0.32% of all housing units) even though its Mosquito

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[3] Source for 2017-2020: Eastern Research Group, *Mosquito Control Task Force Report*, p. 90, Table 3-1, Requests Submitted, 2017–2020. Source for 2021, MDAR data request.
[4] See for example:
https://www.bostonglobe.com/2020/12/01/metro/toxic-forever-chemicals-found-pesticide-used-millions-mass-acres-when-spraying-mosquitos/
[5] Source: Eastern Research Group, *Mosquito Control Task Force Report*, p. 92, Figure 3-1, Map of municipalities that applied to opt out by June 1, 2021

Control Project does not perform larviciding or adulticiding.[6] Franklin (24/26 or 92%)[7] and Hampshire (8/20 or 40%) were also the counties with by far the highest percentage of municipalities that considered opting out of spraying by the State Reclamation and Mosquito Control Board (which is primarily aerial). The next highest was Berkshire county which together indicates that opposition to spraying is higher in Western Massachusetts. Berkshire also had four communities (=13%) that considered aerial opt-out, which was the third-highest percentage statewide. Furthermore, the Berkshire MCP performs spraying but the number of opt outs are *double* the spray requests (see next section below for detail). Hampden county is lower than the others in the Pioneer Valley MCP perhaps due to its high level of urbanization (Springfield, etc.). Many if not most of the opt-outs in the Pioneer Valley MCP would seem to represent philosophical statements against state and local spraying, as well as possibly wanting to protect their properties from pesticides in the event of a policy change by the MCP that would result in ground-based spraying.

There are 11 more rural towns spread across five counties with an opt-out rate of at least 3%:

Town Name	COUNTY	Peak Annual Opt Outs	Total Housing Units	Peak Opt Outs per HU (%)
Leyden	Franklin	37	340	10.9%
Plainfield	Hampshire	33	335	9.9%
Cummington	Hampshire	46	477	9.6%
Wendell	Franklin	30	448	6.7%
Petersham	Worcester	34	558	6.1%
Bolton	Worcester	116	1,982	5.9%
Leverett	Franklin	34	827	4.1%
Worthington	Hampshire	25	625	4.0%
Boxford	Essex	97	2,818	3.4%
Wales	Hampden	28	896	3.1%
Sheffield	Berkshire	53	1,766	3.0%

Figure 2

Two communities (Bolton and Boxford) are in mosquito districts with high levels of spray requests. These high rates of opt out indicate stronger opposition to spraying. Four of these communities in the Pioneer Valley also applied for municipal opt-outs (Leyden, Plainfield, Wendell and Leverett).

[6] Eastern Research Group, *Mosquito Control Task Force Report* (draft), p. 66

[7] Six towns in Franklin county discussed opting out but did not ultimately submit applications to the state but the total is indicative of opposition to spraying.

Analysis by Mosquito Control District

Opt out rates vary with the twelve MCDs in the state as shown in Figure 3. Two MCDs have opt-out rates that are higher than spray requests, Berkshire and East Middlesex. (Suffolk could fall into this category with 2021 data.) As previously noted for counties, there are four MCDs with opt outs and no spray requests because the MCDs do not spray, Pioneer Valley, and the Cape and Islands. Within the five MCDs that spray heavily (Bristol, Central, Norfolk, Northeast and Plymouth), the opt outs as a percentage of spray requests range from a low of 1% in Bristol to 15% in Northeast. There is no ready explanation for this significant variation but education about mosquito control and philosophical attitudes towards spraying are possible candidates. Plymouth county, while not having the lowest ratio, did have had the highest number of EEE cases (n=15) in the last twenty years.[8] Plymouth and Bristol counties have the large amounts of EEE habitat[9] and have been sprayed aerially during the last four EEE outbreaks.[10] Yet, Essex county does too but the Northeast District has a relatively larger number of individual and municipal opt outs.[11]

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[8] Source: Eastern Research Group, *Mosquito Control Task Force Report*, p. 21, Table 5, Incidence of Human Cases of EEE by County from 2000 to 2020

[9] Source: Eastern Research Group, *Mosquito Control Task Force Report*, p. 16, Table 3-2, Acres of EEE Mosquito habitat by MCD

[10] Source: Eastern Research Group, *Mosquito Control Task Force Report*, p. 118, Table 4-2, Aerial Spraying Due to an EEE Outbreak, 2009–2020

[11] Note that West Nile Positivity rates (as shown on Table 3-3 on page 19) do not seem to influence opt-out rates (and is, in fact, inversely correlated). East Middlesex and Pioneer Valley have high WNV rates for example.

MCD Name	Spray Requests (2020)	Opt-out Requests (2020)[12]	Ratio of Opt Outs to Sprays Requests	Total Housing Units (2020)	Spray Requests per Housing Unit	Opt-out Requests per Housing Unit
Berkshire County MCP	96	198	2.06	32,971	0.3%	0.6%
Bristol County MCP	12,979	128	0.01	243,464	5.3%	0.1%
Cape Cod MCP	0?	55		164,885		0.0%
Central Mass. MCP	16,831	660	0.04	442,957	3.8%	0.1%
Dukes MCP	0	0		17,530	0.0%	0.0%
East Middlesex MCP	102	114	1.12	406,868	0.0%	0.0%
Nantucket MCP[13]	1	0	0.00	12,169	0.0%	0.0%
Norfolk County MCD	9,107	295	0.03	250,905	3.6%	0.1%
Northeast Massachusetts	1,917	285	0.15	309,362	0.6%	0.1%
Pioneer Valley MCD	0	46		84,057	0.0%	0.1%
Plymouth County MCP	17,923	453	0.03	218,111	8.2%	0.2%
Suffolk County MCP	27	5	0.19	301,702	0.0%	0.0%
Total	58,983	2,239	0.04	2,484,981	2.4%	0.1%

Figure 3

Note: The Opt Out rates are *much higher for 2021* but the comparable spray request data is not available for 2021.

[12] Source: Eastern Research Group, *Mosquito Control Task Force Report*, p. 66, Table 4-5, Number of Exclusion and Service Requests by MCD in 2020, plus Opt-out requests from MDAR data for Dukes and Pioneer Valley.

[13] Nantucket MCP was only in existence from 2014 to 2018. Source: https://malegislature.gov/Bills/190/H4644/BillHistory

Appendix 1
Municipalities that Publicly Discussed Opting Out

Town Name	COUNTY	Municipal Opt out
Amherst	Hampshire	0
Ashby	Middlesex	0
Ashfield	Franklin	1
Becket	Berkshire	1
Bernardston	Franklin	-1
Beverly	Essex	1
Buckland	Franklin	1
Charlemont	Franklin	1
Colrain	Franklin	-1
Conway	Franklin	1
Egremont	Berkshire	1
Erving	Franklin	0
Gill	Franklin	1
Gloucester	Essex	1
Goshen	Hampshire	1
Greenfield	Franklin	1
Halifax	Plymouth	-1
Harvard	Worcester	0
Hatfield	Hampshire	1
Hawley	Franklin	-1
Heath	Franklin	1
Leverett	Franklin	0
Leyden	Franklin	1
Middlefield	Hampshire	1
Montague	Franklin	1
New Salem	Franklin	0
Northfield	Franklin	-1
Northampton	Hampshire	1
Orange	Franklin	0
Pelham	Hampshire	0
Pepperell	Middlesex	1
Pittsfield	Berkshire	-1
Plainfield	Hampshire	1
Rockport	Essex	1
Rowe	Franklin	1
Shelburne	Franklin	-1
Shutesbury	Franklin	0
Sunderland	Franklin	0

Town Name	COUNTY	Municipal Opt out
Uxbridge	Worcester	-1
Warwick	Franklin	-1
Wendell	Franklin	0
Westhampton	Hampshire	1
Whately	Franklin	1
Williamsburg	Hampshire	1

Key: 1 = Accepted, 0 = Denied, -1 = Discussed but no report submitted or accepted.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 24, 2021 11:08 am
Browser:	Safari 11.1.2 / OS X
IP Address:	73.218.192.105
Unique ID:	851595731
Location:	

Name	Joanne
Subject:	Mosquito spraying
Comments:	How about encouraging bluebird boxes and bat boxes on properties. Both have mosquitoes in their regular diet. I had hundreds of bats at dusk on my property until mosquito control and my neighbors began spaying insecticides indiscriminately. I've lost my bats! NEED TO EDUCATE THE PEOPLE.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 25, 2021 9:10 am
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	75.144.152.237
Unique ID:	852039491

Name	Beth Casoni
Organization / Affiliation:	Massachusetts Lobstermen's Association
Subject:	Mosquito spraying in the Commonwealth near the shoreline
File	https://massgov.formstack.com/admin/download/file/11225454900

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 29, 2021 6:31 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	108.8.227.69
Unique ID:	853738740
Location:	

Name	Miriam Kurland
Organization / Affiliation:	Climate Action Now
Subject:	First Use should always be organic solutions rather than chemicals
Comments:	I believe that mosquito control must try natural, organic methods before any use of pesticides. The chemicals in pesticides are endangering the health and well being of so many species, our children and life on Earth. Please make policies that prioritize solutions that do not involve chemicals, whenever possible and strongly limit the use of pesticides when all other solutions have not worked and require extreme measures. thank you

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 29, 2021 8:32 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	67.142.100.29
Unique ID:	853761677
Location:	

Name	Ken Kipen
Subject:	Regarding Mosquito Control Practices in MA:
Comments:	Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. MA must legislate stricter regulation of private pesticide use. Inert ingredients for products sold in MA must be a required disclosure.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 12:48 am
Browser:	Mobile Safari 14.7 / iOS
IP Address:	209.6.8.120
Unique ID:	853810588
Location:	

Name	Emily Abbott
Subject:	Mosquito control
Comments:	To whom it may concern: As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following: • Regarding Mosquito Control Practices in MA: • Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. • If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. • Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. • MA must legislate stricter regulation of private pesticide use. • Inert ingredients for products sold in MA must be a required disclosure. • Regarding Municipal Opt Out Policy: • There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in. • In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly. • The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 7:16 am
Browser:	Chrome 92.0.4515.107 / OS X
IP Address:	97.80.115.90
Unique ID:	853884371
Location:	

Name	Mary Kolodny
Subject:	Pesticide spraying for mosquito control in MA
Comments:	Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. • If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. • Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. • MA must legislate stricter regulation of private pesticide use. • Inert ingredients for products sold in MA must be a required disclosure.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 7:18 am
Browser:	Safari 14.1.2 / OS X
IP Address:	76.118.101.197
Unique ID:	853884963
Location:	

Name	Patricia Neary
Organization / Affiliation:	Bridgewater Green Committee
Subject:	Mosquito Control
Comments:	We, the public, should be able to choose NOT to have our property sprayed aerially or by truck. To blanket spray, which has been proven NOT effective for the target, is detrimental to ALL insects (in spite of government propaganda).

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 9:26 am
Browser:	Firefox 91.0 / Windows
IP Address:	71.234.43.54
Unique ID:	853933519
Location:	

Name	Amy Sophia Marashinsky
Comments:	As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following: • Regarding Mosquito Control Practices in MA: • Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. • If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. • Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. • MA must legislate stricter regulation of private pesticide use. • Inert ingredients for products sold in MA must be a required disclosure. • Regarding Municipal Opt Out Policy: • There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in. • In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly. • The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 9:29 am
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	73.238.155.189
Unique ID:	853935169
Location:	

Name	MaryJo Stanley
Subject:	Mosquito Control Task Force

Comments:

In the course of trying to solve one issue, we humans are notorious for lover-riding the consequences for whichever option we decide to use, somehow convincing ourselves that one evil might be less evil than another and choose the lesser evil.

But what would happen if we all decided to choose only options that are 100% safe for all life? What if we refused to get into arguing over one dangerous approach over another? What if we focused on the problem with such integrity and dedication that we discovered the true resolution of any given problem? what if we ignored the pleas of various corporations, power mongers, cost wars, and emotional responses.

I implore you as a Task Force to do just that. We need to create a safer world, not add even one drop more of toxins upon our water, land, in the air. It make take a genius to find a solution to the issue of mosquitos, but let's remember that mosquitos are not a new phenomena, nor are any diseases they might incur. And nature is a powerful force, with billions of years of success at survival. We are babies on this planet, and as such are fully competent to make ill-advised choices, often stuck in the same mindset that has caused so many of today's crises.

I hope there are some women in this task force, ones not trained culturally to shoot at the enemy. We all know how that war ends. Widespread destruction and absolutely no resolution of the original problem. Perhaps a temporary peace, but with the festering remains of what caused the war to begin with.

Humans are not the most important beings on the planet, and only if we can finally learn how to live with nature in a harmonious, respectful manner, we are sure to be the next species of extinction.

I am not saying yes or no to spraying poisons to eradicate mosquitoes. I am saying we are dealing with dangerous stuff here, and an entire world, a web of nature we barely understand and throwing chemicals as a solution is no solution at all.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 9:47 am
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	24.91.28.172
Unique ID:	853943376
Location:	

Name	Jodi Rodar
Subject:	Mosquito Control In Massachusetts

Comments:

To whom it may concern:
As the Task Force for the 21 st Century discusses the future of Mosquito control in MA, here is
my position regarding the following:
? Regarding Mosquito Control Practices in MA:
? Due to the lack of efficacy and product danger, adulticide and larvicide spraying
by truck or by plane, should not be used throughout the state, even in a declared
state of health emergency. If larvicides are used, the briquette form should be
locally applied to the smallest targeted areas.
? If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
? Personal Opt Out Exclusions must be honored, regardless of regional impact,
even during a declared state of health emergency. Accurate drift calculations
must be calculated to protect opted out property.
? MA must legislate stricter regulation of private pesticide use.
? Inert ingredients for products sold in MA must be a required disclosure.
? Regarding Municipal Opt Out Policy:
? There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted
out, and allowed to request being opted in.
? In 2021, municipalities were not given guidelines regarding criteria for approval
in the opt out process. In 2022, that criteria must be published months in advance,
so towns have time to plan and budget accordingly.
? The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt
out applications, the requirements for approval in 2022 cannot be retroactively
based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 10:01 am
Browser:	Chrome 92.0.4515.130 / Chrome OS
IP Address:	161.77.224.124
Unique ID:	853950428
Location:	

Name	Marilyn O'Neil
Subject:	Mosquito Control

Comments:

To whom it may concern:
As the Task Force for the 21 st Century discusses the future of Mosquito control in MA, here is
my position regarding the following:
? Regarding Mosquito Control Practices in MA:
? Due to the lack of efficacy and product danger, adulticide and larvicide spraying
by truck or by plane, should not be used throughout the state, even in a declared
state of health emergency. If larvicides are used, the briquette form should be
locally applied to the smallest targeted areas.
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must be calculated to protect opted out property.
? MA must legislate stricter regulation of private pesticide use.
? Inert ingredients for products sold in MA must be a required disclosure.
? Regarding Municipal Opt Out Policy:
? There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted
out, and allowed to request being opted in.
? In 2021, municipalities were not given guidelines regarding criteria for approval
in the opt out process. In 2022, that criteria must be published months in advance,
so towns have time to plan and budget accordingly.
? The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt
out applications, the requirements for approval in 2022 cannot be retroactively
based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 10:09 am
Browser:	Chrome 92.0.4515.130 / Chrome OS
IP Address:	161.77.224.124
Unique ID:	853954152
Location:	

Name	Marilyn O'Neil
Subject:	Mosquito Control
Comments:	I would also like to say that in this day and age, we know far better than to use pesticides and herbicides AT ALL ! It is absolutely absurd that in trying to make our lives more "comfortable; easy; and / or 'life saving'" - - we are in actuality killing ourselves fully, by killing the ecosystems which we totally depend on. NO PESTICIDES / NO HERBICIDES !!! Also - - there should be clear and stringent laws protecting private properties from neighboring private properties use of poisons that are then carried over to other properties by wind, etc.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 10:33 am
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	71.233.115.75
Unique ID:	853965869
Location:	

Name	Susan Roitman
Subject:	No pesticides please
Comments:	Please do more research about how the balance of nature will be disrupted resulting in more mosquitos, fewer birds, etc. There are better ways to control mosquitos. And most likely they will cost less than hiring pesticide companies. There are many other reasons. Please consult scientific experts. Thank you. Susan

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 10:36 am
Browser:	Safari 14.1.2 / OS X
IP Address:	67.142.100.136
Unique ID:	853967483
Location:	

Name	r tippens
Subject:	Mosquito control board
Comments:	Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. MA must legislate stricter regulation of private pesticide use. Inert ingredients for products sold in MA must be a required disclosure. Regarding Municipal Opt Out Policy: There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in. In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly. The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 10:49 am
Browser:	Safari 14.0.3 / OS X
IP Address:	107.77.225.157
Unique ID:	853974091
Location:	

Name	John Cohen
Subject:	mosquito-control spraying
Comments:	I am unilaterally opposed to any spraying meant to control mosquitos. The gains for human health do not justify the damages to the natural environment.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 11:59 am
Browser:	Safari 14.1.2 / OS X
IP Address:	161.77.224.114
Unique ID:	854011610
Location:	

Name	Ziporah Hildebrandt
Subject:	Mosquito spraying

Comments:

whom it may concern:

As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following:

• Regarding Mosquito Control Practices in MA:
• Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane,should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.
• If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
• Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declaredstate of health emergency. Accurate drift calculations must be calculated to protect opted out property.
• MA must legislate stricter regulation of private pesticide use.
• Inert ingredients for products sold in MA must be a required disclosure.

• Regarding Municipal Opt Out Policy:
• There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control.Municipalities should be automatically opted out, and allowed to request being opted in.
• In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly.
• The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

As someone who has been disabled with Multiple Chemical Sensitivities for over 25 years, I am very concerned about the application of pesticides, especially by aerial spraying. Pesticide exposure is one of the causes of my permanent disability.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 12:43 pm
Browser:	Safari 12.0.2 / OS X
IP Address:	162.245.143.97
Unique ID:	854034629
Location:	

Name	Joy Friedman
Subject:	Mosquito Control Practices
Comments:	To whom it may concern: As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following: • Regarding Mosquito Control Practices in MA: • Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. • If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. • Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. • MA must legislate stricter regulation of private pesticide use. • Inert ingredients for products sold in MA must be a required disclosure. • Regarding Municipal Opt Out Policy: • There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in. • In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly. • The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 1:01 pm
Browser:	Safari 14.1 / OS X
IP Address:	209.58.146.166
Unique ID:	854043770
Location:	

Name	Diana Laurenitis
Subject:	NO SPRAYING!!

Comments:

I am writing to say I highly, highly oppose any spraying for mosquitoes in the state.

Mass sprayings from planes and trucks over huge swathes of areas, with poisons that are non-specific and targeted, is incredibly harmful to all of the wildlife. Bug populations are on a steep decline, and as you hopefully know, they are the basis of the food web. It is no coincidence that bird populations are also declining.

I also have a family farm where we don't spray but are not certified organic. I have been putting much effort in for years to revitalize the land and create habitat for native pollinators. I DO NOT want any toxic chemicals sprayed on this land. There are enough toxins in the environment, and it is completely irresponsible and plain stupid to add more. These chemicals affect humans as well, which we have already been seeing work its way through the legal system with glyphosate and the cancer cases created by its use.

What would serve the Commonwealth better is promoting the things that actually take care of the mosquitoes as nature intended, such as increasing bird and bat populations. Nature has a solution to all of these issues, and things are out of balance because humans have made it so.

I live in this state because it is known to be progressive. How about we move beyond pesticides into the future where we can enhance nature not destroy it.

Diana Laurenitis

P.s. Attached is something not written by me, but I agree with all the points presented.

As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following:
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? Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property.
? ?
? Regarding Municipal Opt Out Policy:
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opted out, and allowed to request being opted in.

? In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly.

? The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.

MA must legislate stricter regulation of private pesticide use.

Inert ingredients for products sold in MA must be a required disclosure.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 1:29 pm
Browser:	Chrome 92.0.4515.159 / Windows 7
IP Address:	72.71.212.75
Unique ID:	854057443
Location:	

Name	Deborah Kelley-Milburn
Subject:	Chemical control of mosquitoes
Comments:	I am very concerned about the use of pesticides or any kind of chemical control of mosquitos. My understanding is that the risk off serious, mosquito-borne disease in the state is low, and I urge you to keep in mind that widespread spraying can severely impact vulnerable populations including children, the immune-compromised, the chemically sensitive, the elderly and pets, just to name a few. Spraying and other chemical measures should be used only in extreme circumstances, and local communities should be able to opt out. Thank You!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 2:28 pm
Browser:	Chrome Mobile 92.0.4515.159 / Android
IP Address:	96.252.36.7
Unique ID:	854086384
Location:	

Name	Louise Hetzler
Subject:	Mosquito spraying
Comments:	Dear Task Force, I urge you to stop aerial and ground spraying of mosquitoes with synthetic pyrethrins. In addition to possible PFAS contamination, synthetic pyrethrins such as Resmethrin and Anvil 10 + 10 are toxic to bees and fish, not to mention our lungs, butterflies and other pollinators, dragonflies, fireflies, and songbirds that eat poisoned mosquitoes. Dragonflies are beautiful and they eat mosquitoes. We must stop poisoning the earth and the beautiful creatures who live here. Future generations are counting on us to do the right thing. For many years I have transformed my yard into a pollinator sanctuary. My mint plants attract bees. The two times I saw the Central MA Mosquito Control truck come through the neighborhood in the last 5 years, my hundreds of bees and other pollinators disappeared for the rest of the season. Even with my property excluded, they still disappeared! There is an alternative that is nontoxic to bees and other beneficial insects, a garlic product called Mosquito Barrier that is used all over the world. Also, Disneyworld uses garlic for mosquito control. There are no mosquitoes on garlic fields. Garlic is toxic to mosquitoes. In 2019 the state used Anvil 10+10 contaminated with PFAS in the aerial spraying of over 2 million acres, according to a Boston Globe article on 12/1/20. Many Southeastern Mass towns later found PFAS in their water. Westborough now has PFAS in a couple of town wells from unknown sources. Could that be from the 2019 aerial spraying? We must protect nature and protect our air, soil, and water. Fireflies are flashing and mating at dusk when mosquito spraying occurs. The insect apocalypse is happening now. We need to take drastic steps now to reverse it if we are to survive. The crisis of Covid has given us a golden opportunity to reset our climate agenda to work for healthy soil, water, and air. This decade is our last best hope to turn the tide, regenerate our soil, and reverse climate change. Pollinators are an essential part of the plan. Let's protect them!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 3:23 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	96.233.163.244
Unique ID:	854112358
Location:	

Name	David Greenberg
Organization / Affiliation:	Resident of Colrain
Subject:	Mosquito Control Practices in MA

Comments:

To whom it may concern:

As the Task Force for the 21 st Century discusses the future of Mosquito control in MA, here is
my position regarding the following:
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? Personal Opt Out Exclusions must be honored, regardless of regional impact,
even during a declared state of health emergency. Accurate drift calculations
must be calculated to protect opted out property.
? MA must legislate stricter regulation of private pesticide use.
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out, and allowed to request being opted in.
? In 2021, municipalities were not given guidelines regarding criteria for approval
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? The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt
out applications, the requirements for approval in 2022 cannot be retroactively
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Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 4:26 pm
Browser:	Chrome 92.0.4515.131 / OS X
IP Address:	74.104.165.66
Unique ID:	854145073
Location:	

Name	Richard Lent
Organization / Affiliation:	Sustainable Stow
Subject:	Mosquito spraying
Comments:	I am very concerned about the impacts of mosquito spraying on our declining populations of insects, birds and bats. Given limited effectiveness and identified product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared health emergency. Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. MA must legislate stricter regulation of private pesticide use.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 4:31 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	65.96.242.143
Unique ID:	854147739
Location:	

Name	Christine Pellerin
Subject:	Mosquito Control

Comments:

As an organic farmer and someone with chronic health issues, I am concerned with the Task Force for the 21st Century's Mosquito Control Practices in MA. I would like to make the following comments on future planning:

• Regarding Mosquito Control Practices in MA:
• Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.
• If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
• Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property.
• MA must legislate stricter regulation of private pesticide use.
• Inert ingredients for products sold in MA must be a required disclosure.

• Regarding Municipal Opt Out Policy:
• There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in.
• In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. This created an unfair and arbitrary approval process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly.
• The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Respectfully,
Christine S. Pellerin
482 Turners Falls Rd.
Montague, MA 01351
cspellerin@comcast.net

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 9:38 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	71.235.164.198
Unique ID:	854257046
Location:	

Name	Louise Amyot
Subject:	mosquito control
Comments:	Deaths from mosquitoes in MA are few and far between while the risks to humans and friendly insects, such as bees, moths, butterflies are enormous. People can learn to mitigate their personal risks from mosquito-borne illnesses but none can protect themseelves from toxins distributed into the atmosphere, onto plants and into water. Mosquito control measures that provide for the indiscrimante dispersal of poisons into the atmosphere must not be allowed in Massachusetts or anywhere except in the most extreme circumstances.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 30, 2021 10:34 pm
Browser:	Mobile Safari 12.0 / iOS
IP Address:	73.167.47.68
Unique ID:	854274005
Location:	

Name	David King
Organization / Affiliation:	Coalition against abuse of pesticides
Subject:	Pesticides threaten people and the environment
Comments:	We oppose aerial spraying of pesticides. They do not meaningfully protect people from EEE and threaten human health, especially asthmatics, but also threatened and endangered species. You should expect vigorous legal action if you persist in this reckless and irresponsible action.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 1:49 am
Browser:	Chrome 92.0.4515.131 / Windows
IP Address:	134.174.110.12
Unique ID:	854318009
Location:	

Name	Carolyn Whiting
Subject:	Mosquito Control

Comments:

To whom it may concern:

As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following:

• Regarding Mosquito Control Practices in MA:
• Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.
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This is important to me because multiple sensitivities. Thank you for your consideration of my concerns.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 9:41 am
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	71.192.38.192
Unique ID:	854447859
Location:	

Name	Darcy Sweeney
Organization / Affiliation:	Climate Action Now, Western Massachusetts; Regenerative Farming, Forests, and Food Systems
Subject:	Stop spraying toxic pesticides for mosquito control
Comments:	I am writing to urge you to stop spraying toxic pesticides as a mosquito control measure. First, Eastern Equine Encephalitis and West Nile Virus are exceedingly rare in Massachusetts. In the EEE (the deadlier of the two diseases) outbreak in 2019, four people died. Compare this with the damaging health effects caused by pesticide spraying on the thousands of the most vulnerable among us: children - for whom toxins are especially dangerous -- and people with pre-existing health conditions. Furthermore, spraying toxic pesticides - whether from airplanes or trucks --indiscriminately kills native bumblebees and other pollinators, not to mention sickening or killing birds, amphibians, and countless other creatures. Commonsense tells us that wind drift makes it nearly impossible to control where pesticides land. "Opting out" of spraying is mostly just a fond wish. Ground spraying can drift up to 300 feet - with no wind - and aerial spraying can drift up to eight miles! Clearly, spraying has the potential for unintended contamination with the consequent harms. I urge the Commonwealth to develop and institute safe, effective, ecologically-sound mosquito control measures and to discontinue spraying toxic pesticides. Human health and the health of the environment depend on it.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:24 am
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	75.67.160.49
Unique ID:	854501910
Location:	

Name john shanley

Comments:

As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following:

• Regarding Mosquito Control Practices in MA:
• Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.
• If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
• Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property.
• MA must legislate stricter regulation of private pesticide use.
• Inert ingredients for products sold in MA must be a required disclosure.

• Regarding Municipal Opt Out Policy:
• There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in.
• In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly.
• The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

JOHN P. SHANLEY AND GILDA SHANLEY
16 NICKERSON RD. LEXINGYON MA 02421
AND
28 WAQUOIT LANDING RD. E. FA;MOUTH MA 02536

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:35 am
Browser:	Safari 12.1.2 / OS X
IP Address:	162.245.142.179
Unique ID:	854508118
Location:	

Name	Susan Boscov
Subject:	Mosquito control

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:37 am
Browser:	Safari 12.1.2 / OS X
IP Address:	162.245.142.179
Unique ID:	854509290
Location:	

Name	Susan Boscov
Subject:	Mosquito control
Comments:	Toxic spraying harms other insects, harms people, drifts, and is not necessary as EEE and West Nile are very rare.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:38 am
Browser:	Chrome Mobile 83.0.4103.106 / Android
IP Address:	172.58.222.211
Unique ID:	854509606
Location:	

Name	Newton, MA resident
Subject:	Pest Control restrictions for health of vulnerable populations
Comments:	Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:41 am
Browser:	Firefox 91.0 / Windows
IP Address:	216.193.164.165
Unique ID:	854511571
Location:	

Name	Laurel Facey
Organization / Affiliation:	Wendell AgCom
Subject:	mosquito control
Comments:	We must do all we can to protect our native pollinators! The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:42 am
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	73.16.240.3
Unique ID:	854512132
Location:	

Name	Navid HATFIELD
Organization / Affiliation:	Pioneer Valley Organics Landscaping
Subject:	mosquito spray options and IPM methodolgy
Comments:	Greetings, Massachussetts needs to adopt IPM methods in its land use policies. This starts with the question of whether or not any action should taken in the first place. Do the very small incidents of EEE and WNV warrant the mass exposure of people and wildlife to proven harmful pesticides. If yes, which I would question strongly, then what are the the least interruptive, carcinogenic, and broad spectrum products available to do that. Anvil 10 10 is not that! There are Organic and all natural products that have a higher efficacy at controlling mosquitos, ticks and fleas with out the residual negative effects on pollinators, water ways, amphibians and other wildlife. There is a great product called TICKILLS that uses potent yet biodegradable essential oils of peppermint and cedar. These have been proven to match the efficacy of products like Anvil without the negative costs associated with this chemical cocktail.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:45 am
Browser:	Safari 11.1.1 / OS X
IP Address:	68.118.192.148
Unique ID:	854513907
Location:	

Name	Marian Parker
Subject:	Massachusetts Mosquito Control
Comments:	Here's why I question aerial spraying of Mosquitos: Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 11:58 am
Browser:	Safari 13.1.3 / OS X
IP Address:	24.177.3.19
Unique ID:	854520943
Location:	

Name	annie o'connor
Subject:	Mosquito Control Taskforce: Anvil 10 + 10 HIGHLY TOXIC - DO NOT SPRAY!
Comments:	Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 12:13 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	73.167.110.47
Unique ID:	854528960
Location:	

Name	rick roberts
Comments:	As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following: Regarding Mosquito Control Practices in MA: Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. MA must legislate stricter regulation of private pesticide use. Inert ingredients for products sold in MA must be a required disclosure. Regarding Municipal Opt Out Policy: There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 12:39 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	162.245.143.137
Unique ID:	854542161
Location:	

Name	Peggy Wolff
Organization / Affiliation:	Leverett Climate Action Group
Subject:	Aerial spraying of toxic chemicals
Comments:	I strongly oppose the use of toxic chemicals to control mosquitoes, particularly with aerial spraying. I learned the hard way by becoming very ill for many years, in part due to pesticide spraying. The time is now to do the right thing. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 1:15 pm
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	75.68.212.103
Unique ID:	854560021
Location:	

Name	Lynne Man
Subject:	Stop automatic spraying

Comments:

Dear Mosquito Control Task Force:

I am writing to request that MA cease routine or mandatory spraying for mosquito control. Many of us would rather suffer through mosquitos, than to poison pollinators and birds in what appears to be a pointless and expensive strategy. (We STILL have mosquitos!) Here are the talking point that I agree with:

Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.)

Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.)

Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. (My neighbor has a lung condition that is greatly aggravated by the drift from mosquito spraying).

The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives.

Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying.

We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Thank you for your consideration.

Lynne Man
Lunenburg, MA

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 2:02 pm
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	66.31.130.113
Unique ID:	854582963
Location:	

Name	Jessika Brenin
Comments:	Please do not conduct aerial spraying! I do not believe the risk benefit ratio is high enough to publicly condone contamination of our natural, food, and and water ecosystems with toxic spraying.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 3:29 pm
Browser:	Safari 14.0.3 / OS X
IP Address:	73.149.246.72
Unique ID:	854625605
Location:	

Name	Catherine LeBlanc
Subject:	Mosquito Spraying
Comments:	Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 4:51 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	24.218.183.165
Unique ID:	854663470
Location:	

Name	Laura Reiner
Subject:	Mosquito Spraying
Comments:	The harm to birds, bees and other pollinators caused by aerial spraying for mosquitos far outweighs the health benefits -- EEE and other mosquito-borne illnesses affect a tiny percentage of humans. Please put state funds to better use to improve the environment for all living things!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	August 31, 2021 7:14 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	24.60.63.44
Unique ID:	854740676

Name	Natalie Lashmit
Subject:	Mosquito spraying in Massachusetts

Comments:

To whom it may concern:

The Task Force for the 21st Century will discuss the future of Mosquito control in Massachusetts. I would like to add my comments regarding the following:

Regarding Mosquito Control Practices in Massachusetts:

Adulticide and larvicide spraying by truck or by plane should only be used throughout the state in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.

If aerial spraying is practiced in Massachusetts, drift calculations must be considered and the results used to determine safe aerial practices. Communication regarding spraying needs to be as wide spread, varied and detailed with links to appropriate, accurate and timely information to allow persons impacted to plan to be out of the area.

Personal Opt Out Exclusions must be honored, regardless of regional impact,
even during a declared state of health emergency.

Accurate drift calculations must be calculated and communicated to protect opted out property.

Massachusetts must legislate stricter regulation of private pesticide use.

All ingredients, including inert ingredients, for products sold in Massachusetts must be required disclosures.

Regarding Municipal Opt Out Policy:

There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should request being opted in on an annual basis requiring local Boards of Health and the public to consider the current conditions in their municipality. Town Meeting and City Councils should be ready to address the annual assessment of their community’s needs.

Municipalities need to be provided clear guidelines regarding criteria for approval
in the opt out process. Guidelines regarding the criteria for approval must be published with sufficient time in advance for towns to plan and budget accordingly.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 6:59 am
Browser:	Chrome 87.0.4280.88 / OS X 10.10 Yosemite
IP Address:	68.118.206.148
Unique ID:	854917032
Location:	

Name	Jack Czajkowski
Subject:	Spraying for Mosquitos
Comments:	Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 8:45 am
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	24.34.192.23
Unique ID:	854956934
Location:	

Name	Bill Pula
Organization / Affiliation:	Board of Health
Subject:	Mosquito Control
Comments:	I'm, chairman of the Board of Health. Pelham applied for the Opt Out option and were rejected We are a small town with volunteers staffing most positions and can't fulfill the conditions for that option. I understand mosquitoes are a vector for serious diseases. We are planning to join the Pioneer Valley Mosquito Control District. Many people in Town are opposed to Chemical control I am not but with the District and their monitoring and the town in control I think there would be more acceptance of treatment.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 9:52 am
Browser:	Firefox 91.0 / Windows
IP Address:	73.47.253.211
Unique ID:	854989103
Location:	

Name	Sue Phelan
Organization / Affiliation:	GreenCAPE
Subject:	Mosquito Control Task Force

Comments: September 1, 2021

Members of the Mosquito Control Task Force:

On behalf of GreenCAPE, I would like to express concerns about the use of toxic pesticides to manage mosquitoes in MA, and urge this Task Force to develop a science-based mosquito management policy to submit to lawmakers next year--a policy that prioritizes surveillance, mosquito habitat adjustment, and public education. Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to immune and respiratory systems. The broad use of the synthetic pyrethroid Anvil 10+10 not only replaces one risk to human health with another, but creates a long-term risk to remedy a short-term problem. Beyond that, according to the Centers for Disease Control and Prevention (CDC), the use of adulticides is usually the least effective control technique. (http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnvguidelines2001pdf)

The pesticide Anvil 10+10, sprayed from a plane or truck driving through our neighborhoods, IS harmful to humans and this exposure should be avoided. Anvil is a synthetic pyrethroid, containing sumithrin, piperonyl butoxide (PBO) and undisclosed inert ingredients. Inhaling pyrethroids can cause coughing, wheezing, shortness of breath, runny or stuffy nose, chest pain, or difficulty breathing. One exposure can create chronic asthma in a previously healthy individual. Pyrethroids have been shown in the lab to disrupt the endocrine system by mimicking the effects of the female sex hormone estrogen. Endocrine disrupters can lower the sperm count and cause the growth of abnormal breast cells. Pyrethroids also have been suspected to be a kidney toxicant, a neurotoxicant, and harmful to the thyroid. Skin contact can cause a rash, itching, or blisters. PBO prevents insects from detoxifying sumithrin, is considered more hazardous than most chemicals, can cause skin and eye irritation, and has been classified by the Environmental Protection Agency (EPA) as a possible human carcinogen. Anvil's inert ingredient polyethylbenzene (PEB) is a hazardous chemical that the EPA believes to be potentially toxic. Inert ingredients for pesticide products sold/applied in MA must be a required disclosure.
In 2019, at the same time several Massachusetts communities were struggling to remove PFAS from their drinking water supplies, Massachusetts aerially sprayed 2.2 million acres of the state with Anvil 10+10 and, in 2020, sprayed more than 200,000 acres.
Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS 'forever chemicals". Tests commissioned by Public Employees for Environmental Responsibility (PEER) on Anvil 10+10 revealed it contained approximately 250 parts per trillion (ppt) of PFOA (perfluorooctanoic acid) and 260 - 500 ppt of HFPO-DA (hexafluoropropylene oxide dimer acid, a "GenX" replacement for PFOA).

When the Massachusetts Department of Environmental Protection (MADEP) was alerted of these findings, it independently tested nine samples of Anvil 10+10 from five different containers, and found eight different PFAS, including PFOA and PFOS.
https://cen.acs.org/environment/persistent-pollutants/PFAS-found-mosquito-spray-used/98/i47
The U.S. Environmental Protection Agency (EPA) has a 70 ppt Lifetime Health Advisory for PFOA and PFOS in drinking water. Massachusetts, has a much stricter regulatory limit than the EPA Advisory, i.e., 20 ppt for 6 PFAS substances combined (PFOA, PFOS, PFHxS, PFNA, PFHpA, and PFDA). PFAS are recognized to be persistent, bioaccumulative, and toxic and have been shown in the C-8 Study to be associated with a range of diseases. http://www.c8sciencepanel.org/prob_link.html
Should aerial spraying continue to be practiced MA, conclusive studies on drift must be conducted and the results incorporated into safer aerial practices and accurate drift calculations must reliably omit those properties that opt out. Personal opt out exclusions must be honored and a mechanism whereby municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control must be provided. Municipalities should be automatically opted out, until and unless they request to be opted in.
Spraying pesticides for mosquito control may be worse than ineffective; it may even make the situation worse. Spraying can increase mosquito populations by killing off natural predators (fish, other arthropods, birds, etc.) of the mosquitoes and their larvae, thereby removing natural checks on population levels. A 1997 study looked at trends in populations of Culiseta melanura, the mosquito primarily responsible for transmitting eastern equine encephalitis (EEE) among birds. Over a period of eleven years, Cicero Swamp in central New York State was sprayed fifteen times with the insecticide Dibrom (naled). Instead of declining, the population of Culiseta melanura grew fifteen-fold during this period. The study suggests that the pesticides may have altered the ecological balance of the swamp, killing organisms whose presence would ordinarily help limit the mosquito population. (Howard, John J. and Joanne Oliver. Impact of Naled (Dibrom 14) on the Mosquito Vectors of Eastern Equine Encephalitis Virus," Journal of the American Mosquito Control Association. Vol. 13, No. 4 (December 1997), pgs. 315-325.)
Dr. Ray Parsons, of the Harris County Mosquito Control Division in Houston, observed that malathion may actually aggravate Culex, causing an increase in aggressive biting behavior for an hour or two after spraying. (New York Public Interest Research Group, Interview with Dr. Ray Parsons. Harris County (Texas) Mosquito Control Division. September 11, 1999.)
It has been said that "every biocide selects for its own failure." This means that mosquitoes can and will become resistant to chemical efforts to destroy them. Overuse of pesticides may create resistant "super-mosquitoes" that require ever increasingly toxic chemicals to kill them.
Finally, residents living in sprayed areas may experience a false sense of security. If they "feel" that fewer mosquitoes are in the area due to

spraying, they may be less likely to use more proven measures to prevent mosquito breeding on their property and ignore or forget personal protective measures to reduce mosquito bites including the use of repellents, appropriate clothing, and avoidance of outdoor activity during twilight hours when many mosquitoes are most active.
Some Mosquito Control Districts-such as that on Cape Cod- have discontinued fogging and aerial spraying for mosquito control because these pose an unacceptable risk to residents, farmers, and tourists. As mentioned earlier-these measures are also ineffective in that they kill only a limited percentage of mosquitoes, increase the number of mosquitoes by destroying predators, create pesticide resistance by the mosquitoes to future control efforts, and can agitate mosquitoes to be more aggressive biters. Local mosquito control puts emphasis on monitoring mosquito populations, identification and elimination of breeding sites-primarily utilizing grounds crews and larvicides- along with public education to avoid dangerous and ineffective truck-based fogging and aerial spraying. Residents and tourists alike feel assured that the Cape Cod Mosquito Control Project is taking responsible action and not creating an even worse public health problem by needlessly exposing them to a mixture of harmful chemicals, not all of them identified or fully characterized with regard to impacts on human health and the environment.

We urge you to extrapolate this proactive model to other communities throughout the Commonwealth and be more diligent with early monitoring and habitat adjustment. We are opposed to adopting policy that involves automatic unnecessary spraying of mosquitoes and suggest the communities affected in the past might be better served with appropriate information on avoidance strategies and implementation of larvicidal services on known breeding sites earlier in the season ahead of a crisis. In the interests of protecting the health and safety of the residents of the Commonwealth, MA must legislate stricter regulation of private pesticide use as well and create a pesticide use database for all purchases and applications of pesticides in the State.

Sincerely,

Sue Phelan, Director
GreenCAPE
P.O. Box 631
West Barnstable, MA 02668
508.362.5927

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 10:52 am
Browser:	Safari 14.1.1 / OS X
IP Address:	161.77.224.126
Unique ID:	855019790
Location:	

Name	Leslie Cerier
Subject:	No spraying for mosquitoes

Comments:

To whom it may concern:

As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following:

• Regarding Mosquito Control Practices in MA:
• Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.
• If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
• Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property.
• MA must legislate stricter regulation of private pesticide use.
• Inert ingredients for products sold in MA must be a required disclosure.

• Regarding Municipal Opt Out Policy:
• There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in.
• In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly.
• The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 11:20 am
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	98.229.127.147
Unique ID:	855035366
Location:	

Name	Patricia OHagan
Organization / Affiliation:	Mothers Out Front
Subject:	Spraying to kill mosquitos
Comments:	Please please do not spray hazardous chemicals on our lawns--they kill bees and beneficial insects. the spray is irritating to those with pulmonary conditions. EEE is rare, sports times can be changed away from dusk when mosquitos are out. NO to spraying to kill mosquitos

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 11:27 am
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	24.218.242.146
Unique ID:	855038897
Location:	

Name	Gail Alden
Subject:	NO to spraying for Mosquitos
Comments:	Spraying chemicals to kill mosquitos is a bad idea. It kills other insects and is toxic to humans. The risk of mosquito borne diseases in Mass. is extremely low. Our environment is more important than protecting the one or two who contract a disease from a mosquito bite. Vote NO on spraying. Thank you. Gail Alden

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 12:15 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	67.246.16.22
Unique ID:	855064917

Name	Noah Henkenius
Organization / Affiliation:	Berkshire Environmental Action Team
Subject:	Re- Mosquito Control Task Force Report
Comments:	Please see our comments in the attached document.
File	https://massgov.formstack.com/admin/download/file/11267176902

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 12:38 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	24.181.226.186
Unique ID:	855076709
Location:	

Name	Dr. Joann Lindenmayer
Organization / Affiliation:	Uxbridge Board of Health
Subject:	Oppose aerial spraying for adult mosquito control
Comments:	As a public health professional for the past 32 years (and veterinarian by training), I oppose the use of aerial spraying to control adult mosquito populations. My reasons for coming to this conclusion are the following: 1. Spraying eliminates only 38% of the population that is reached, leaving 62% untouched and still able to transmit arboviruses; 2) as a former Epidemic Intelligence Service officer trained in epidemiology by the Centers for Disease Control and Prevention, I know that it is impossible to measure the effectiveness of spraying by linking it to human illness and deaths. The only indicator that is measurable is the mosquito population reachable at the time of spraying, and, as noted above, this is only an indirect, proxy measure and ineffective. I have grave concerns about the insect and aquatic populations that would be harmed by aerial spraying for mosquitoes and believe strongly that, as we humans have overrun the environment, we will do greater damage to the environment that sustains us and all living things if we permit aerial spraying to proceed. The most effective measures to prevent human illness and deaths are personal protective measures undertaken by individuals and education and outreach undertaken by state and local health departments. Early application of larvicides can also be effective but this needs to be done in March/April. By the time adult mosquitoes pose a threat to people, it is too late for larvicide application and too dangerous to the environment for spraying. I fervently hope that aerial spraying is never again permitted in Massachusetts.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 12:51 pm
Browser:	Safari 14.1.1 / OS X
IP Address:	70.105.228.13
Unique ID:	855083369
Location:	

Name	Emily Haslett
Organization / Affiliation:	Mothers Out Front Lincoln
Subject:	Mosquito Spraying Should Not Happen in Massachusetts
Comments:	Hi, As a member of Mothers Out Front Lincoln and a mother of four, I am writing to list some of the many reasons Massachusetts should not spray for mosquitoes. EEE and West Nile are a miniscule threat compared to what the devastating human and ecological effects would be of the toxic spray. There is no way to control where the spray lands because of unpredictable wind conditions, and it will pollute waterways as well as farmland. We know too much about the hazards of wantonly spraying toxic chemicals. Let's stop, please. Enough is enough. Thank you for thinking about our children's and their children's future and about the fragility of this planet. Respectfully, Emily Haslett

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 12:51 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	66.30.51.59
Unique ID:	855083381
Location:	

Name	Stacey Parks
Subject:	Mosquito Spraying
Comments:	Please do not do this!!! It is ineffective in controlling West Nile virus and EEE. The spraying is not targeted enough and lands in waterways and on organic farmland. It is harmful to bees which are already in a dangerously dwindling state. Please, please, please pause. Thank you!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 1:07 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	76.19.120.246
Unique ID:	855091727
Location:	

Name	Linda Hillson
Organization / Affiliation:	Lunenburg Community Pollinator Habitat
Subject:	Please stop routine mosquito spraying
Comments:	Please stop routine mosquito spraying. Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 1:09 pm
Browser:	Safari 14.1.1 / OS X
IP Address:	173.76.107.157
Unique ID:	855092639
Location:	

Name	Belinda Gingrich
Subject:	Please don't spray!
Comments:	I would rather be exposed to a mosquito bite than to unknown chemicals which could have long term effects . Have we learned nothing since Rachel Carson published Silent Spring? We thought we knew what the long term effect of spraying was in the 60's and the cancer rate 30 years later was awful. I don't want my family to be exposed to these risks. There is no way spraying will eliminate mosquitoes but it will damage other insects and throws the balance off. Please don't spray!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 1:21 pm
Browser:	Safari 14.1.1 / OS X
IP Address:	134.174.140.250
Unique ID:	855098716
Location:	

Name	Mohammed Hannan
Organization / Affiliation:	Hannan Agro Farms
Subject:	NO Mosquito spraying please!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 1:29 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	173.76.107.157
Unique ID:	855102553
Location:	

Name	Paul Gingrich
Subject:	Mosquito Spraying
Comments:	Dear Task Force, We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season. No more spraying of pesticides, please. Regards, Paul G.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 1:40 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	107.77.223.79
Unique ID:	855107577
Location:	

Name	Bryn Gingrich
Subject:	No spraying for the environment
Comments:	Please consider this submission of comments against mosquito spraying in MA. Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 2:01 pm
Browser:	Safari 12.1 / OS X
IP Address:	73.253.73.87
Unique ID:	855117765
Location:	

Name	NAncy Fleming
Subject:	NO to mosquito spraying
Comments:	Please do not spray chemicals on our yards, or fields and our animals to kill mosquitoes. If the spray kills mosquitoes, it also kills that which we depend on - our health, our food systems and our soils. it is hard to believe that with all we have learned in the last 50 years, that anyone would even be considering such actions. Please do NOT spray.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 4:33 pm
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	65.96.169.181
Unique ID:	855190674
Location:	

Name	Ann Spanel
Organization / Affiliation:	Mass. Association of Chemically Injured
Subject:	Comments to Mosquito Control Task Force

Comments:

Regarding Mosquito Control Practices in MA:
? Due to the lack of efficacy and product danger, adulticide and larvicide spraying
by truck or by plane, should not be used throughout the state, even in a declared
state of health emergency. If larvicides are used, the briquette form should be
locally applied to the smallest targeted areas.
? If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
? Personal Opt Out Exclusions must be honored, regardless of regional impact,
even during a declared state of health emergency. Accurate drift calculations
must be calculated to protect opted out property.
? MA must legislate stricter regulation of private pesticide use.
? Inert ingredients for products sold in MA must be a required disclosure.
? Regarding Municipal Opt Out Policy:
? There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted
out, and allowed to request being opted in.
? In 2021, municipalities were not given guidelines regarding criteria for approval
in the opt out process. In 2022, that criteria must be published months in advance,
so towns have time to plan and budget accordingly.
? The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt
out applications, the requirements for approval in 2022 cannot be retroactively
based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 4:51 pm
Browser:	Safari 14.1.1 / OS X
IP Address:	73.186.54.164
Unique ID:	855199085
Location:	

Name	Sarah Bliss
Subject:	Mosquito control: ban pesticide aerial and truck spraying!
Comments:	As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following: • Regarding Mosquito Control Practices in MA: • Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. • If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. • Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. • MA must legislate stricter regulation of private pesticide use. • Inert ingredients for products sold in MA must be a required disclosure. • Regarding Municipal Opt Out Policy: • There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in. • In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly. • The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 4:54 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	71.192.11.60
Unique ID:	855200159
Location:	

Name	John Nelson
Organization / Affiliation:	Plainfield Conservation Commission
Comments:	Due to lack of data on effectiveness and safety of state-wide aerial spraying, it should not be used as the method of choice. If it is used at all, communities should, by default be "opted out" with the option of opting in. The better choice is to use selective measures, such as eliminating mosquito breeding sites and using biological control (e.g. B. thuringiensis var. Israeliencis, larvicide) in areas in which arbovirus has actually been detected.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 5:44 pm
Browser:	Chrome Mobile 83.0.4103.106 / Android
IP Address:	174.192.2.35
Unique ID:	855220397
Location:	

Name	Tracy Hartshorn
Subject:	Mosquito control legislation
Comments:	We should not be using mosquito controls in chemical form at all and especially if humans are not impacted greatly. The difference between 4 to 0 people is small. Furthermore, invest in biological controls of mosquitoes such as bats and dragonflies and birds. Plant more wild areas for flowers to grow to stimulate the proliferation of such wildlife. Lastly, encourage home owners and businessed to reduce grass only areas so that wild flowers can grow. Chemical sprays are detrimental for all wildlife and linger in the ecosystem through bioaccumulation. We must learn to become harmonious with nature and not to control it. All life has been wild longer than humans have existed. We need wildlife more than it needs us, so let's take care of wildlife.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 8:08 pm
Browser:	Firefox 78.0 / OS X
IP Address:	73.219.141.122
Unique ID:	855269314
Location:	

Name	rebecca muller
Subject:	opposition to the use of blanket mosquito spraying and an advocating for opt outs

Comments:

To whom it may concern:

As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following:

• Regarding Mosquito Control Practices in MA:
• Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas.
• If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
• Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property.
• MA must legislate stricter regulation of private pesticide use.
• Inert ingredients for products sold in MA must be a required disclosure.

• Regarding Municipal Opt Out Policy:
• There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in.
• In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly.
• The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 1, 2021 8:19 pm
Browser:	Firefox 91.0 / Windows
IP Address:	75.68.213.210
Unique ID:	855272567
Location:	

Name	A McCall
Subject:	Don't Spray!
Comments:	Widespread spraying of noxious pesticide chemicals kills too many beneficial insects - not just mosquitoes. The insects covered with chemicals are ingested by all kinds of birds and other animals, which are then poisoned. We humans are killing too many other creatures for our own convenience. There are other ways to prevent mosquito bites and spread of disease. Please don't spray!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 12:17 am
Browser:	unknown / unknown
IP Address:	18.118.82.97
Unique ID:	855328954
Location:	

Name	K. Krusell
Subject:	Feedback for the Mosquito Control Task Force

Comments:

Dear Task Force Members:

I respect your goal to mitigate Arboviruses.

As one of the 15% of citizens of the Commonwealth (i.e. approximately 1.6 million) who have been disabled by substances registered by the EPA at levels considered GRAS, my survival depends on your next steps. Accordingly, I ask you to incorporate the following.

Regarding Mosquito Control Practices in MA:
• Emphasis on IPM, public education, and larvaciding with briquettes should take precedence since these methods are the most effective, least toxic means of pest control.
• Widespread spraying, by plane or truck,should be discontinued since it has a history of nominal efficacy and significant detrimental impacts on human health.
• Personal Opt Out Exclusions should be granted to preserve and protect vulnerable populations.
• MA must review stricter regulations for private pesticide use, drift requirements, etc.
• So called inert ingredients for products sold in MA should be a required disclosure, ideally on the label.

Regarding Municipal Opt Out Policy:
• There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in.
• In 2021, municipalities say they were not given sufficient guidelines regarding criteria for approval in the opt out process. In 2022, that criteria should be published months in advance, so towns have time to plan and budget accordingly.
• The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Thank you for your time and consideration.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 9:38 am
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	98.229.127.147
Unique ID:	855463299
Location:	

Name	Phoebe Chatfield
Subject:	Spraying toxins is NOT worth the risk!
Comments:	Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 12:29 pm
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	74.104.165.66
Unique ID:	855544931
Location:	

Name	Sharon Brownfield
Organization / Affiliation:	First Parish Church Stow and Acton
Subject:	Comments on Mosquito Spraying
Comments:	Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season. Please reconsider any spraying - We in Stow certainly don't want it. There are ways individuals can protect themselves. Let's not further damage the environment.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 1:00 pm
Browser:	Firefox 91.0 / Windows
IP Address:	216.193.175.218
Unique ID:	855559314
Location:	

Name	Anna Hanchett
Organization / Affiliation:	Plainfield Agricultural Commission
Subject:	reasons for an environmentally friendly mosquito control program

Comments:

On behalf of the Plainfield Agricultural Commission I am writing to encourage your further efforts to change the emphasis of the state's mosquito control program from spraying pesticides, i.e. killing, to more environmentally sensible reduction of man-made mosquito breeding places and education of our residents to self-protective measures.

The aerial spraying of pesticides is both dangerous and relatively ineffective in reducing the target species. It does, however, have dangerous effects on many people and disastrous results in populations of untargeted species of many types from insects to fish to arachnids, amphibians, and small mammals. Almost all insects -- including honeybees, native bumblebees, and other pollinators -- are harmed or killed by aerial pesticide spraying. Many types of mosquito predators are also harmed by the insecticide, thus reducing the possibility of natural mosquito control. Spraying is a relatively uncontrollable means of spreading a pesticide due to drift, temperature, and the imprecision of aerial dispensing. It has the potential for unintended contamination of open water, gardens, and livestock and crops of both conventional and organic farms.

We must also remember that mosquitoes in each of their life stages provide important food to a wide variety of insects and animals.

Plainfield successfully opted-out of the state mosquito control spray program this year. We are actively continuing our public educational efforts using posters, handouts, tabling, and school projects to raise awareness of both the dangers and the necessity of mosquitoes and how we humans can safely live with what is admittedly a nuisance and sometimes a carrier of disease.

Respectfully submitted by the
Plainfield Agricultural Commission,

Anna Hanchett, chair
Bi-sek Hsiao
Ed Stockman
Sadie Stull
Education committee:
Anne Williamson
Chris Stockman

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 1:55 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	72.19.80.55
Unique ID:	855585679
Location:	

Name	Jason Rupp
Subject:	Aerial spraying
Comments:	To whom it may concern: As the Task Force for the 21st Century discusses the future of Mosquito control in MA, here is my position regarding the following: • Regarding Mosquito Control Practices in MA: • Due to the lack of efficacy and product danger, adulticide and larvicide spraying by truck or by plane, should not be used throughout the state, even in a declared state of health emergency. If larvicides are used, the briquette form should be locally applied to the smallest targeted areas. • If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices. • Personal Opt Out Exclusions must be honored, regardless of regional impact, even during a declared state of health emergency. Accurate drift calculations must be calculated to protect opted out property. • MA must legislate stricter regulation of private pesticide use. • Inert ingredients for products sold in MA must be a required disclosure. • Regarding Municipal Opt Out Policy: • There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted out, and allowed to request being opted in. • In 2021, municipalities were not given guidelines regarding criteria for approval in the opt out process. In 2022, that criteria must be published months in advance, so towns have time to plan and budget accordingly. • The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season." While municipalities may be held accountable for what they promised in their 2021 opt out applications, the requirements for approval in 2022 cannot be retroactively based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 4:00 pm
Browser:	Firefox 91.0 / Windows
IP Address:	71.233.112.226
Unique ID:	855644080
Location:	

Name	Ellen Moyer
Subject:	Stop the Spray
Comments:	Eastern Equine Encephalitis and West Nile Virus are exceedingly rare diseases. (The annual estimated WNV number of deaths in MA with no mosquito control of any kind is two. The estimated EEE number of deaths with no mosquito control is four.) Contrast these tiny numbers with the thousands of children and adults with pre-existing health conditions who are put at heightened risk of adverse health effects from aerial and truck spraying of toxins. (Children are much more susceptible to toxic pesticides than are adults.) Wind drift makes it difficult to control where pesticides land -- ground spraying can drift up to 300 feet even with no wind and aerial spraying can drift up to eight miles! Spraying has the potential for unintended contamination of open water, gardens, and organic farms. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Birds, bees, wildlife in general, and insects -- including honeybees, native bees, and other pollinators -- as well as natural predators of mosquito larvae --are harmed or killed by aerial or roadside pesticide spraying. We are never going to get rid of all mosquitoes, nor do we want to as they are valuable food for other insects, birds, and bats. Municipalities and the Commonwealth must avoid the possible need for mosquito-spraying in the late summer by creating and instituting plans for safe, effective, and ecologically-sound mosquito control measures early in the season.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 4:02 pm
Browser:	Firefox 91.0 / Windows
IP Address:	161.77.41.41
Unique ID:	855644757
Location:	

Name	Kenneth Lederman
Subject:	use of pesticides for mosquito control
Comments:	Please limit the use of pesticides for mosquito control. They harm the environment and, over time, cause health problems for much of the population. Thank you. Kenneth Lederman and Helena Dinerman

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 4:14 pm
Browser:	Mobile Safari 14.1.2 / OS X
IP Address:	71.233.63.86
Unique ID:	855650646
Location:	

Name	Carol Houde
Subject:	Spraying for Mosquitoes
Comments:	Given the importance of protecting and encouraging pollinators including honeybees and bumblebees, and the fact that one bumble bee is already extinct, there should be a definitive guidelines for spraying pesticides, and only under the most dire circumstances. The public needs to take personal responsibility for their own safety by avoiding high biting times and wearing the appropriate clothing to prevent bites. There cannot be a cavalier attitude about this. Pesticides are also dangerous to wildlife. Recent bird die-offs have been attributed to the overuse of pesticides while spraying for cicadas. The balance of nature is important for the Planet. There is no Earth #2.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 9:41 pm
Browser:	Chrome 92.0.4515.159 / Windows
IP Address:	66.189.61.143
Unique ID:	855754345
Location:	

Name	Heidi A Dollard
Organization / Affiliation:	Massachusetts Pollinator Network
Subject:	Eliminate all mosquito spraying
Comments:	Mosquito spraying is damaging to human health as well as the environment. It is expensive and ineffective. It should be stopped completely.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 2, 2021 11:35 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	71.174.216.22
Unique ID:	855779041
Location:	

Name	James Vander Poel
Subject:	Spraying for mosquitos: why?
Comments:	I live in Northborough, near the headquarters of the Central Massachusetts Mosquito Control Project. Over the years, spraying has been done in my neighborhood. I don't know what chemicals have been used in the past, but I do know that the amount of effort expended, and the toxic effect of today's chemicals on pollinating insects and humans is simply not worth it. Not enough lives are saved to warrant the environmental damage done by the spraying of toxic chemicals that do more damage to the environment. I live in an area where there is standing and/or slow-moving water, so I'm not unfamiliar with mosquitos. But I'd rather put up with them and have bees around. Let's put a stop to the spraying of toxic chemicals. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 3, 2021 5:34 pm
Browser:	Chrome 90.0.4430.93 / Windows 8.1
IP Address:	98.229.37.69
Unique ID:	856110618
Location:	

Name	Jean Lemieux
Organization / Affiliation:	Massachusetts Association for the Chemically Injured
Subject:	Comments to the Task Force
Comments:	Please be sure to include the Comments that MACI sent in during the listening session.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 7, 2021 3:05 pm
Browser:	Chrome 92.0.4515.131 / Windows
IP Address:	108.20.24.17
Unique ID:	857297202
Location:	

Name	Cathleen Drinan
Organization / Affiliation:	Plymouth County Mosquito Control Project
Subject:	Hiedi Ricci's comment on pyrethroids
Comments:	During the 9-2-21 Taskforce meeting, Hiedi Ricci's comment ed that EPA says pyrethroids need more study. I cannot find that on EPA's website. Could you send us a link to that? What I found was this: What is The Current Regulatory Status of Pyrethroids? We are currently reevaluating all pyrethrins, pyrethroids and synergists through registration review. Registration review is our program for systematically reviewing all registered pesticides every 15 years to make sure that every pesticide can still perform its intended function without unreasonable adverse effects on human health or the environment. As a result of the Food Quality Protection Act, EPA must consider the cumulative risks of pesticides that, like the pyrethroids and pyrethrins, share a common mechanism of toxicity. In November 2011, we completed a cumulative risk assessment for the pyrethroids/pyrethrins and identified no cumulative risks of concern. This assessment is available from Regulations.gov, docket EPA-HQ-OPP-2011-0746.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 10, 2021 7:40 pm
Browser:	Safari 14.1.1 / OS X
IP Address:	96.230.1.107
Unique ID:	858925170
Location:	42.576698303223, -70.954902648926

Name	Ingrid Barry
Subject:	Chemical spraying for mosquito control
Comments:	Please do not make the standards for municipalities and landowners to opt-out of spraying of pyrethroid pesticides in your attempt to control mosquitoes. There are more effective ways to reduce the risk of WNV and EEE - including restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat. Too much harm to nature comes from the spraying and no guarantee of benefits.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 10, 2021 7:59 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	24.194.105.3
Unique ID:	858929241
Location:	43.131301879883, -74.35710144043

Name Carolyb Bishop

Subject: Mosquito Control

Comments:

> Back in the 1970s it was common for towns to routinely spray several times a year to 'control' various pests including mosquitoes. Sevin, malathion and other toxics were used.

In 1979 a statewide committee was formed to examine the role of the Pesticide Board and develop a Generic Environmental Impact Report on the use and impact of pesticides in mosquito control. I was on the Citizens Advisory Committee. The report was competed but never adopted until it was revised in 1995. (source available with "Pesticide Board" search).

The use of aerial spraying was heavily criticized as being ineffective and environmentally damaging. As one professional said "To be effective a drop of spray must hit the insect, like going after a butterfly with a machine gun"!

> There are so many alternatives for mosquito control: most simply public education on eliminating standing water where mosquitoes breed; then CO2 traps to monitor population, Bti in wetlands and Altocid briquets in storm drains, both for larval control and finally if necessary truck spraying with Sumethrin, a pyrethoid against EEE but recognizing the ineffectiveness of such broadcasting.. As shown aerial spraying is a disastrous method with negative side effects.

We are good at inventing toxic chemicals but not so good at controlling the uses or unintended consequences.
>

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 11, 2021 1:38 pm
Browser:	Chrome 92.0.4515.159 / OS X
IP Address:	75.67.170.223
Unique ID:	859113468
Location:	41.635398864746, -70.943496704102

Name	Marjorie Greville
Subject:	Mosquito Control Spraying
Comments:	I would like the state to halt all spraying of pesticides on landscapes until there is proof that the poison works. I believe most if not all of the sprayed pesticides hurt the environment by killing non-targeted insects, birds, and fish and contaminating farm soils. As a human - I do not want to breathe any of the spray.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 12, 2021 9:30 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	71.235.166.201
Unique ID:	859423739
Location:	42.634201049805, -72.602600097656

Name	Jonathan Kennedy
Subject:	Mosquito Control Task Force

Comments:

To whom it may concern:

As the Task Force for the 21 st Century discusses the future of Mosquito control in MA, here is
my position regarding the following:

? Regarding Mosquito Control Practices in MA:
? Due to the lack of efficacy and product danger, adulticide and larvicide spraying
by truck or by plane, should not be used throughout the state, even in a declared
state of health emergency. If larvicides are used, the briquette form should be
locally applied to the smallest targeted areas.
? If aerial spraying is practiced in MA, conclusive studies on drift must be conducted and the results used to determine safe aerial practices.
? Personal Opt Out Exclusions must be honored, regardless of regional impact,
even during a declared state of health emergency. Accurate drift calculations
must be calculated to protect opted out property.
? MA must legislate stricter regulation of private pesticide use.
? Inert ingredients for products sold in MA must be a required disclosure.
? Regarding Municipal Opt Out Policy:
? There should always be a mechanism where municipalities can exempt themselves from Reclamation Board and Mosquito Control Districts and maintain autonomous local control. Municipalities should be automatically opted
out, and allowed to request being opted in.
? In 2021, municipalities were not given guidelines regarding criteria for approval
in the opt out process. In 2022, that criteria must be published months in advance,
so towns have time to plan and budget accordingly.
? The 7/12/2021 letters from the EEA to municipalities approving opt out for municipalities, stated, "To facilitate planning improvements throughout the remainder of this season, please see attached for a document containing mosquito control resources for cities and towns. We expect that your municipality will review these materials and implement best practices to the maximum extent practicable throughout the rest of the season."

While
municipalities may be held accountable for what they promised in their 2021 opt
out applications, the requirements for approval in 2022 cannot be retroactively
based on expanded criteria changed mid-July.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 13, 2021 7:10 am
Browser:	Safari 14.1.2 / OS X
IP Address:	76.19.153.44
Unique ID:	859542077
Location:	

Name	Stuart Armstrong
Subject:	Mosquito control
Comments:	I do not support the use of spraying for mosquito control. The cost and benefit don't match up. And spraying kills a lot of other key insects and pollinators that has a negative impact on birds, amphibians, mammals, humans and agriculture. Please discontinue mosquito spraying as currently used and look for safer more effective more cost efficient alternatives.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 13, 2021 3:21 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	72.70.43.175
Unique ID:	859789794
Location:	

Name	Paulajean O'Neill
Subject:	Mosquito control
Comments:	Please NO CHEMICAL SPRAYING! It is 2021 and we need to use science based, ecologically sound methods to reduce health risks associated with mosquitoes.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 13, 2021 4:48 pm
Browser:	Safari 14.7 / OS X
IP Address:	24.34.108.108
Unique ID:	859832932
Location:	42.533500671387, -71.10359954834

Subject: Mosquito Control Policy in Massachusetts

Comments: I attempted to read your report, not easy for average citizen to understand the conclusions. I will say I'm opposed to spraying pesticides to kill mosquitoes because it's affecting more than just mosquitoes and it's appalling and inappropriate to force organic growers or municipalities to " opt out" instead of having an "opt in" system. Rather than harming nature by carpet bombing our land with pesticides can't we come up with a better solution? Aren't bees and other pollinators unnecessarily attacked by these methods? I personally apply mosquito repellent to myself when I walk in nature, I do not spray my surroundings, and this method works quite well. I change the water in my birdbath daily. These are not difficult things. I will be disappointed if the State can't come up with a better solution. We should be able to improve on past practices, not just continue spraying because it's easier.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 13, 2021 8:59 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	73.114.51.49
Unique ID:	859920063
Location:	

Name	beth thomson
Organization / Affiliation:	unaffiliated
Subject:	safe mosquito control
Comments:	Please find environmentally friendly mosquito control methods. Current practices endanger both human and environmental health. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 14, 2021 12:20 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	71.234.243.83
Unique ID:	860203909
Location:	

Name	Ryan Dorsey
Subject:	Please stop spraying our communities with chemicals
Comments:	As a resident of Massachusetts for the last decade, I am deeply concerned by the state's widespread use of pyrethroid pesticides for mosquito control. Not only are these methods lacking in scientific evidence to support their effectiveness, they represent a grave danger to our state's already threatened biodiversity as well as to our residents. I encourage you to put the state's resources to better use by employing mosquito control methods that are rooted in ecological restoration, rather than statewide spraying as the default. Through science-based, ecological restoration approaches, we can still meet our goals of reducing the danger of disease, while also strengthening the nature-based solutions that we know are a win-win for our climate and communities.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 14, 2021 12:48 pm
Browser:	Firefox 92.0 / Windows
IP Address:	73.219.142.32
Unique ID:	860218924
Location:	42.181800842285, -71.196197509766

Name	Alyssa Foos
Subject:	No forced spraying please
Comments:	There are more effective ways to reduce the risk of WNV and EEE. These include personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat. Nature-based solutions can also have the added benefit of strengthening resilience to climate impacts like flooding. I work at the community garden in Norwood, and do not want our organic gardens full of pollinators/bees ruined by spraying. Thank you for listening.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 14, 2021 4:28 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	70.90.105.145
Unique ID:	860328660

Name	Michele Grzenda
Organization / Affiliation:	Lincoln Conservation Dept
Subject:	Mosquito Bite Prevention
Comments:	To whom it may concern, I oppose expanded pesticide spraying and support ecologically based management mosquito control focused on protection of human health and the environment. There are more effective ways to reduce the risk of WNV and EEE – including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat. attached is a town-wide flyer sent to all Lincoln residents. I urge the task force to consider increased education and outreach resources for towns and cities to share with their residents.
File	https://massgov.formstack.com/admin/download/file/11344886670

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 14, 2021 6:28 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	76.118.101.197
Unique ID:	860375984
Location:	42.08039855957, -70.939300537109

Name	Pat Neary
Organization / Affiliation:	Bridgewater Green Committee
Subject:	Mosquito Control
Comments:	There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat, than spraying everything! Why do you continue this polluting, wasteful practice?

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 14, 2021 9:23 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	71.233.115.75
Unique ID:	860430276
Location:	

Comments:

Please update your practices to reflect the reality of studies that show spraying to be ineffective and instead concentrate on public education about mosquito breeding places to eliminate and personal mosquito protection.

Thank you, Susan, a concerned citizen who doesn't want to see bees and many other beneficial insects destroyed by mosquito spraying. That is just financially foolish.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 15, 2021 6:30 am
Browser:	Safari 14.1.2 / OS X
IP Address:	67.142.100.219
Unique ID:	860544270
Location:	37.750999450684, -97.821998596191

Name	Ken Kipen
Organization / Affiliation:	PATH, Ashfield
Subject:	M osquito control vs. public & environmental health
Comments:	Please reconsider in favor of environmental health and safety! These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Your agency's analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. There are more effective ways to reduce the risk of WNV and EEE, including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to natural breeding habitat.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 15, 2021 10:11 am
Browser:	Firefox 92.0 / Windows
IP Address:	71.192.36.90
Unique ID:	860630731
Location:	42.329399108887, -72.693901062012

Name	Hollis Wheeler
Organization / Affiliation:	Mass. Pollinater Network
Subject:	Mosquito Pesticide Spraying----DON'T DO IT
Comments:	Dear Task Force: We are ALREADY in the 7th Great Extinction of all animals, including insects other than mosquitos, and birds, that are affected by mosquito pesticide spraying. We are drowning the world and ourselves in pesticides, and it has to stop. This is intimately connected to global warming and the barren world we are leaving our children, grandchildren, and all God's creatures. A dozen cases/fatalities of mosquito borne illnesses a year PALES by comparison to the mega-death and destruction we are wielding with pesticides. Permit towns that want to opt out to be released. Hollis Wheeler

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 15, 2021 2:43 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	71.232.85.236
Unique ID:	860772390
Location:	42.55659866333, -71.908599853516

Name	Roberta Flashman
Organization / Affiliation:	Ashby Naturals
Subject:	Negative effects of mosquito spaying
Comments:	In an area of Massachusetts that has no/none EEE or WNV reported, it is irresponsible for the state to disallow an opt-out for the town of Ashby. We have many many farms in town, most of which are organic - either certified or otherwise. We also have many, many bee keepers in town. The sprays being proposed for indiscriminate use will negatively affect both bees, native and domesticated, and render false the organic label for all produce. In addition, the dense forests of Ashby have been shown to be basically impenetrable beyond 150 ft from a road. Also, wetlands are adversely affected, which echoes throughout the wildlife of Ashby into birds and mammals as well as humans. The opt out process was a joke. To continue forward as though it was valid is also a joke and shows a blatant disregard for people in this area of Massachusetts. Think again! Think about how far the state went to ensure that vaccination for COVID were accepted by the population and how many activities were curtailed. Then think about what you are doing on the other side of the spectrum to adversely affect areas not in harms way of the mosquito. Shame. Shame. Shame. Sincerely, Roberta Flashman

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 15, 2021 4:04 pm
Browser:	Chrome 93.0.4577.82 / Windows
IP Address:	100.0.125.66
Unique ID:	860811535
Location:	42.06079864502, -71.233703613281

Name	Jane Pierce
Subject:	Mosquito Control Programs

Comments:

As a Massachusetts landowner and wetland scientist, I am strongly opposed to expanded pesticide spraying. The state's existing mosquito control programs are antiquated and fragmented. Fundamental reform of legislation governing mosquito control is needed to update the programs and make them consistent with the best available public health based operating standards.

I strongly support the use of a scientifically and ecologically based mosquito-borne disease management program to protect public health, while minimizing environmental and public health risks associated with some forms of mosquito control.

The 2021 Mosquito Control Task Force Report summarizes current mosquito control practices and confirms that there is no quantifiable evidence that current practices, including the routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and also pose health risks to people. Despite the lack of data on effectiveness, the Report claims that reducing spraying would increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals.

The spraying of pesticides to control adult mosquitoes is the least effective and most environmentally damaging method of mosquito control. Because mosquitoes breed so rapidly and in so many locations, most current mosquito control practices have only local and temporary effects on numbers of biting mosquitoes.

From a human health perspective, the risks of mosquito-borne disease must be balanced against the risks of human health effects of pesticides. Spraying should only be conducted where the risk of human cases of WNV or EEE is high due to actual presence of WNV- or EEE-carrying mosquitoes in close proximity to concentrations of human habitation.

The Massachusetts Department of Public Health (DPH) should be the primary authority establishing the protocols for spraying based on best available science and risk assessments. The DPH's Massachusetts Arbovirus Surveillance and Response Plan emphasizes preventing mosquito bites through public education, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito eating predators to natural habitats. The DPH also supports judicious, targeted use of larvicides such as in catch basins.

The state recently denied requests from 11 communities to opt-out of chemical spraying, and has indicated that the standards for municipalities and landowners to opt-out will be made even more stringent next year. As a landowner who believes in nature's environmental processes, and who

grows food and pollinator gardens without pesticides, I do not want to be subjected to chemical spraying if the state program continues in this direction.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 15, 2021 10:40 pm
Browser:	Safari 11.1 / OS X
IP Address:	74.74.202.209
Unique ID:	860941361
Location:	43.166698455811, -77.825202941895

Name	Anne O'Connor
Subject:	Opposition to expanded pesticide spraying/Support for ecological mosquito control measures

Comments:

Dear Mosquito Control Task Force,

I am writing in opposition to expanded pesticide spraying and in support of ecologically based mosquito control measures focused on protection of human health and the environment.
According to the state's report on current mosquito control practices, there is no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases.

I am extremely concerned that such chemicals are being used. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals.

There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat.

My own community, Williamstown MA, where I served as a Member of the Select Board through May of this past year, does not do blanket spraying and would not want to move in that direction. In the past, our approach has involved the elimination of avoidable breeding areas, and targeted use of larvicides. Williamstown also passed a resolution in 2018 declaring our community "Pollinator-Friendly": widespread mosquito spraying violates this resolution and is not consistent with our Town's values or interests.

For these reasons, I urge you to reject any expansion of the mosquito control practices.

Anne O'Connor
201 Cole Ave, Apt 103
Williamstown, MA 01267

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 12:48 pm
Browser:	Firefox 92.0 / Windows
IP Address:	216.193.173.10
Unique ID:	861219015
Location:	42.173301696777, -72.771499633789

Name	Cindy Hartwell
Subject:	NO to Mosquito spraying!
Comments:	I greatly object to the routine spraying of pyrethroid pesticides for mosquito control in our communities and on private property. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. There are better, and much less harmful ways to protect against WNV and EEE without spraying the land with poison. Please reevaluate your study to consider harmful effects to pollinators, the environment - especially agriculture, and people's overall health. And lastly, you need to honor the wishes of any community who has requested an opt-out!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 1:00 pm
Browser:	Firefox 91.0 / Windows
IP Address:	174.192.16.205
Unique ID:	861224542
Location:	

Name	Mary Thomas
Subject:	Mosquito spraying
Comments:	Reports that insect populations have declined by 75% came out four years ago. It's irresponsible for Massachusetts not to have changed its aerial mosquito spraying policy in response. It's also extremely offensive to the communities who made the effort to apply to opt out to have those applications turned down. How dare some agency in Boston make these decisions for us? Human beings need to stop eliminating other species in order to prevent one or two human illnesses.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 1:27 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	216.193.165.160
Unique ID:	861238884
Location:	42.173301696777, -72.771499633789

Name	Amy Simmons
Subject:	Pesticides
Comments:	Please do not spray pesticides on Wendell. Let us choose our own insect repellents. We are all capable of applying bug repellent as needed. We do not need poison sprayed broadly over our town. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 3:39 pm
Browser:	Mobile Safari 13.0.5 / iOS
IP Address:	216.193.164.114
Unique ID:	861300881
Location:	

Name	Clifford Dornbusch
Organization / Affiliation:	Tree warden of Wendell
Subject:	No pesticide spray for mosquitos; please
Comments:	Hi, I am writing to request on behalf of the ecological balance of the planet to not spray pesticides to reduce mosquito populations here in Massachusetts and especially in Wendell/ franklin county. Tho they are a nuisance this area is a swamp where mosquitos are in high population. This is also the home of large populations of dragon flies and bats. Poisoning the mosquitos will lead to ecological collapse of the fish, invertebrate, bird and other sensitive species that depend on healthy insects for their survival. Please do not put human comforts over the health and long terms success of these habitats and species at risk. With gratitude, Clifford P.S. Dornbusch

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 4:09 pm
Browser:	Firefox 90.0 / Windows
IP Address:	216.193.164.218
Unique ID:	861315473
Location:	42.173301696777, -72.771499633789

Subject: mosquito spraying

Comments:

Aside from the fact, literal proven FACT (science and proof ABOUND) that other methods of mosquito control WORK BETTER, there is OVERWHELMING and unquestionable scientific evidence that -- even pesticide labels and MSDS reflect this -- pesticide is harmful poison that injures health and well-being of people. Human beings and the environment deserve better. We deserve to live in good health and to utilize the MOST SAFE AND EFFECTIVE means of mosquito control.

Our survival DEPENDS on this. Our happiness depends on this. I know from experience and knowledge. I've been dealing with this for over twenty years.

Pesticide control agents are KNOWN to disrupt endocrine and respiratory function as well as central nervous system/inhibit acetylcholine. This isn't just documented fact, it is experienced by humans and animals upon exposure. They work the same on us as they do on insects. And the suffering is immense. Some of the damage is NOT REVERSIBLE.

I moved to Massachusetts from NY and CT after being exposed to pesticides sprayed for West Nile Virus because the spraying made me so sick. My health, including hormones, were never the same. BECAUSE THIS AREA DOES NOT SPRAY REGULARLY, I have been slowly able to recover some of my health.

If you spray here, where am I to go then? I can stay away from mosquitoes in my house or using other methods, but I CANNOT AVOID CHEMICAL AGENTS SPRAYED ALL AROUND ME.

The only time I ever saw a mosquito when they sprayed in CT was AFTER they sprayed. I watched friends and friends' children get sick from the spraying. I don't even want to get into what happened to my body, but the dangers of POISON cannot be understated.

I was exposed again three years ago to pesticide by a family member, and both myself and my partner suffered greatly. I had to go back on oxygen. Watching my partner get sick from it, who had been in good health prior, was a terrifying nightmare. He slowly got better but he has not recovered 100%.

People get sick from pesticides. Some of the reactions are rationalized to be something else and explained away, when they are FROM THE PESTICIDE. I have seen it time and time again. Including mood changes.

The only reason I have maintained any level of health since literally fleeing NY because of spraying is because THEY HAVEN'T BEEN SPRAYING HERE.

Organophosphates are basically nerve agents. And the agents supposedly "derived from chrysanthemums"/so-called "natural" ARE STILL

ENDOCRINE/HORMONE DISRUPTORS. They poison everything, not just insects. The effects are noticeable and immediate.

Furthermore, spraying them DOES NOT WORK. USE METHODS THAT ARE SAFER AND WORK BETTER.

If you have read this, you can no longer claim ignorance. I have told you. It's up to you now.

Read stories of pesticide poisoning if you have to. But DO NOT SPRAY HERE. I beg you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 6:52 pm
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	216.193.164.250
Unique ID:	861376257
Location:	42.173301696777, -72.771499633789

Name	Julia Rabin
Organization / Affiliation:	Town citizen
Subject:	Mosquito Spraying
Comments:	I do not want any spraying to take place to control the mosquito populations. This is a bad idea for the following reasons. Spraying will effect other important insect populations negatively. This will not reduce the risk of transmitted disease to zero, while effecting our environment in many negative ways. We need to do everything we can to protect wildlife populations, which in turn help the forests remain in better natural balance and this in turn helps keep human health in better balance, (humans are negatively effected by toxic spraying of chemicals too). Please do not do this spraying. Humans have to live with risk too!!!!!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 7:12 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	72.74.251.10
Unique ID:	861382126
Location:	41.978298187256, -70.746696472168

Name	Joan Lyons
Organization / Affiliation:	The Landing Environmental Group
Subject:	Toxic Chemical mosquito spraying
Comments:	The chemicals used in the spraying are highly toxic to bees, fish and other species beneficial to our environment, and also unhealthy for humans to breathe.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 7:53 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	216.193.165.31
Unique ID:	861393109
Location:	42.173301696777, -72.771499633789

Name	Judy Hall
Subject:	Mosquito Spraying
Comments:	I believe it is unnecessary to use an insecticide spray against mosquitos in rural MA as we have many wildlife species that hunt/eat them, including swallows, dragonflies, bats, other birds, damselflies, tadpoles, turtles, frogs, and on. There is not enough scientific evidence that the sprays proposed do not harm other insect life, bats, pollinators, or humans.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 8:34 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	71.235.178.249
Unique ID:	861404489

Name	Julia Blyth
Subject:	advocating for ecological mosquito management policy
File	https://massgov.formstack.com/admin/download/file/11360655149

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 16, 2021 9:39 pm
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	98.229.67.135
Unique ID:	861422021

Name	Linnea Meyer
Subject:	Mosquito Control in MA
Comments:	Please see attached.
File	https://massgov.formstack.com/admin/download/file/11360905720

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 12:22 am
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	75.68.85.64
Unique ID:	861458637
Location:	42.617900848389, -70.715400695801

Name	Hazel Hewitt
Subject:	Recommendations for more effective, less harmful mosquito management policy

Comments:

Dear Members of the 21st Century Mosquito Task Force ,
As a Massachusetts resident I was extremely concerned by an unusual dearth of bees in my pollinator garden this year. I am deeply worried by current practices of aerial spraying to control mosquitoes, especially since the chemical of choice, ANVIL, has been found to contain highly toxic chemicals harmful not only to other beneficial insects and organisms but also to human health. Even more concerning is the finding in the recent report that there is no quantifiable evidence that these practices are effective in reducing the incidence of mosquito born diseases such as EEE and WNV,

More effective methods exist and I urge this Task Force to develop a science-based, ecological mosquito management policy to submit to lawmakers next year.

Ecological mosquito management prioritizes preventative measures, and includes:
- Monitoring and surveillance
- A strong focus on public education and personal protective measures
- Emphasis on eliminating breeding sites
- Consideration of local ecology
- A tiered approach to management: attempting non-toxic approaches such as habitat manipulation first; conducting Larvaciding based on monitoring for predefined thresholds; and permitting Adulticiding (spraying for adult mosquitoes) only during public health emergencies, when there is significant threat of mosquito-borne disease based on predefined thresholds, and all other, less toxic methods have been attempted and found ineffective

Application of any mosquito adulticide should be the least toxic product available.

In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities.

It is essential to cease unrestricted spraying of toxic pesticides. This raises serious health concerns, especially during a pandemic, since the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which are attacked by Covid-19.

If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases.

I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. It is of the utmost importance to me and other concerned residents that this opportunity is not missed.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 2:24 pm
Browser:	Chrome Mobile 93.0.4577.62 / Android
IP Address:	174.255.65.85
Unique ID:	861811531

Name	Elysia Shanahan
Subject:	Mosquito Spraying Observations
Comments:	Care must be taken with pesticidal spraying over or near tidal rivers, salt marshes and shallow coastal ecosystems. These sensitive environments often suffer observable fishkill of minnows and small crustaceans, many of which are juvenile forms of future commercial catches, and/or are vital links in the complex food chains found in these ecosystems. I have witnessed silvery drifts of minnows washing up lifeless with the rising tide after mosquito sprays. Please ensure spraying is properly timed with the tides for minimal chemical concentration to minimize fishkill. Thank you!
File	https://massgov.formstack.com/admin/download/file/11366981464

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 2:25 pm
Browser:	Chrome 93.0.4577.82 / Windows
IP Address:	24.63.161.230
Unique ID:	861812253

Name	Brian Farless
Organization / Affiliation:	East Middlesex Mosquito Control & Suffolk County Mosquito Control
Subject:	Comments on the ERG Report
File	https://massgov.formstack.com/admin/download/file/11366993978

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 2:49 pm
Browser:	Safari 14.1.2 / OS X
IP Address:	71.248.175.245
Unique ID:	861822135

Name	Pine duBois
Organization / Affiliation:	Jones River Watershed Association
Subject:	ERG Report comment for the Task Force
Comments:	Please accept the attached letter regarding the Mosquito Control and the ERG Report for the Task Force. Thank you
File	https://massgov.formstack.com/admin/download/file/11367147337

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 2:55 pm
Browser:	Chrome 85.0.4183.121 / OS X
IP Address:	161.77.224.126
Unique ID:	861824881
Location:	42.587600708008, -72.599502563477

Name	Leslie Cerier
Subject:	No toxic spraying for mosquitos
Comments:	I oppose expanded pesticide spraying and I support ecologically based management mosquito control focused on protection of human health and the environment. Background: Last year, the Legislature created a Mosquito Control for the 21st Century Task Force to review and recommend updates to the state's antiquated mosquito control program. The state commissioned a report summarizing current mosquito control practices. It confirms that there is no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. The state recently denied requests from 11 communities to opt-out of chemical spraying and has indicated that the standards for municipalities and landowners to opt-out will be made even more stringent next year. If you are growing food or pollinator gardens without pesticides, you may be subjected to spraying if the program continues in this direction. There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 3:06 pm
Browser:	Firefox 86.0 / OS X
IP Address:	161.77.226.108
Unique ID:	861829198
Location:	42.587600708008, -72.599502563477

Name	Rebecca
Comments:	Please allow towns and individuals to opt out of mosquito spraying. I have a chronic illness that impacts my lungs, and want to be able to not have chemicals sprayed on my home or near my home. Thank you!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 3:08 pm
Browser:	Firefox 92.0 / Windows
IP Address:	71.234.43.54
Unique ID:	861830235
Location:	

Name	Amy Sophia Marashinsky
Subject:	the mosquito control task force
Comments:	We know that increased spraying of carcinogens will increases damage to humans and animals. There are more "forever" chemicals in our soil, water and food than ever before. Rather than continue to up the ante with toxic chemicals, it behooves us to find natural solutions. Natural solutions that don't harm humans and animals.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 3:22 pm
Browser:	Firefox 92.0 / OS X
IP Address:	91.149.244.254
Unique ID:	861835805
Location:	52.239398956299, 21.036199569702

Name	Marina Gurman
Subject:	I oppose expanded pesticide spraying
Comments:	I am writing to oppose expanded pesticide spraying and to support ecologically based management mosquito control focused on protection of human health and the environment. I disagree with the conclusions of the report made by the Mosquito Control for the 21st Century Task Force. The report stated that there is no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. The state recently denied requests from 11 communities to opt-out of chemical spraying and has indicated that the standards for municipalities and landowners to opt-out will be made even more stringent next year. People who are growing food or pollinator gardens without pesticides, may be subjected to spraying if the program continues in this direction. This is disgusting. There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat. Where is your shame? Where is your conscience?

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 3:26 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	24.62.200.170
Unique ID:	861837176
Location:	42.389598846436, -72.453399658203

Name	Julianna Smith
Subject:	Environmental Toxins
Comments:	I greatly appreciate your work to reduce the high risks we face in this area from mosquitoes. I know the consequences can be terrible. But as one who faces chronic health problems that are aggravated by environmental toxins, especially pesticides, I would like to see the state do more to support solutions that do not add toxic chemicals to the general environment, but enlist communities to reduce breeding environments, increase wetlands and fish access to breeding areas and look to the long term health of our land and people, including those of us with chronic illnesses. Thank for listening to those of us with small pockets, but big concerns.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 3:50 pm
Browser:	Chrome 93.0.4577.82 / Windows
IP Address:	71.10.236.222
Unique ID:	861846992
Location:	

Name	Michelle Caron
Organization / Affiliation:	Homeowner/Business Owner of Harmony Way
Subject:	Against Current Mosquito Control
Comments:	I am a resident and business owner, as well as a pollinator gardener and herbalist in Wilbraham, MA. I also personally have an allergy to pyrethroid insecticides that is anaphalactic. These particular toxins, as with many insecticides, kill a vast majority of pollinators, rather than the intended mosquitoes/other pests. There are many less toxic, much more effective ways to handle mosquito control, based on the current scientific evidence available. These would likely be more cost-effective and would help to control the mosquito populations. The current plan is ineffective and creates a host of problems for pollinators and ecosystems. The current plan is also toxic to humans and to our food supply. This plan MUST be revised and made less toxic/more effective and more pollinator-friendly. It is disgraceful that our Commonwealth is wasting money and time on outdated practices that only cause harm, rather than actually alleviating mosquito problems and the illness issues that they bring with them. Better means must be obtained with the use of experts and available scientific data to utilize what actually works effectively, instead of the current plan in place. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 4:07 pm
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	174.83.23.12
Unique ID:	861855003
Location:	42.131801605225, -71.973098754883

Name	Lucinda Pauley
Organization / Affiliation:	Lathrop Community
Subject:	Mosquito spraying
Comments:	I strongly believe that mosquito spraying is far worse than mosquitos. The chemicals create environmental problems and affect the health and well being of people and children, as well as animal and plant life. The chemicals do not biodegrade. This supports corporations who have little interest in the well being of the planet. People who are aware of this and don't want the spray need to be respected. Please attend to this problem.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 4:38 pm
Browser:	Firefox 78.0 / OS X
IP Address:	72.93.26.222
Unique ID:	861866288

Name	Clint Richmond
Organization / Affiliation:	Mass. Sierra Club
Subject:	MCTF Report - August 2021
Comments:	The Sierra Club has conducted an in-depth supplementary analysis on opt-outs (attached) that highlights the fact that there is significant opposition to wide-area spraying. While opinions on this subject are mixed, as you know, it is important to acknowledge this opposition in all the decisions that the Task Force and the state makes regarding mosquito control.
File	https://massgov.formstack.com/admin/download/file/11367860752

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 4:46 pm
Browser:	Chrome 92.0.4515.131 / OS X
IP Address:	66.31.119.204
Unique ID:	861869029

Name	Kyla Bennett
Organization / Affiliation:	Public Employees for Environmental Responsibility (PEER)
Subject:	Comments on ERG's MCTF Report
Comments:	Please see attached comment letter on ERG's Report to the MCTF. Thank you.
File	https://massgov.formstack.com/admin/download/file/11367904870

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 4:58 pm
Browser:	Firefox 92.0 / Windows
IP Address:	71.163.108.234
Unique ID:	861873272

Comments:	The attached letter is being submitted on behalf of the undersigned organizations: Beyond Pesticides Community Action Works Campaigns Conservation Law Foundation LEAD for Pollinators Jones River Watershed Association Massachusetts Association of Conservation Commissions Massachusetts Sierra Club NOFA/Mass These comments include some factual corrections that we request be compiled separately from commentary. Thank you for considering these comments, and your work on this important issue.
File	https://massgov.formstack.com/admin/download/file/11367970472

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 5:06 pm
Browser:	Chrome 93.0.4577.82 / Windows
IP Address:	71.233.59.183
Unique ID:	861875926

Name	Heidi Ricci
Organization / Affiliation:	Mass Audubon
Subject:	Mosquito Control Task Force Consultant Study Comments
Comments:	Mass Audubon's comments on the consultant's report are attached.
File	https://massgov.formstack.com/admin/download/file/11368010973

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 5:34 pm
Browser:	Chrome 93.0.4577.82 / Windows 7
IP Address:	96.233.164.137
Unique ID:	861884830
Location:	42.514801025391, -72.809097290039

Name	Ruth Heuberger
Organization / Affiliation:	private
Subject:	mosquito control
Comments:	Weighing all the pros and cons, we are in favor of reducing the plague of mosquitoes which we in no way encourage. With advance warning, we can keep ourselves, children and pets indoors until the spray has settled. .

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 5:50 pm
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	66.31.106.111
Unique ID:	861889438
Location:	

Name	Nicholas Rodenhouse
Organization / Affiliation:	None
Subject:	Comments regarding the Mosquito Control Task Force Report

Comments:

My area of research is avian ecology, and I have been monitoring the abundance insects - food for birds - for over 20 years. I am co-author of a paper that was published in Biological Conservation (Harris et al. 2019) about the decline of beetle abundance and diversity in a northeastern forest, the Hubbard Brook Experimental Forest, NH, USA. Because I have spent 40 years reading the scientific literature, I am pretty good at it. With that preface, my comments about the current mosquito control program in the Commonwealth of Massachusetts and the Mosquito Control Task Force Report follow. Because my comments are long, I begin with some bullet points.

• There seems to be no evidence that either roadside or aerial spraying is effective in reducing human risk from EEE.

• The current spray program is very likely to harm predators of mosquitoes, but the evidence is inadequate to determine whether this is true.

• Seemingly no research is being done to determine which methods of control are most effective in reducing human risk of mosquito-borne viruses.

• In addition, I can find no references to research being done to determine why EEE is spreading and threatening more communities.

•Insect abundance, biomass and diversity are collapsing in all sampled areas of the world, but not mosquito abundances. Declines are primarily in areas like the northeastern states that are dominated by settled areas. One of the primary causes suggested in most papers documenting these declines is the increasing, use over ever broader areas, of pesticides, particularly insecticides.

I am sure that all agree that something needs to be done to reduce the threat and contain the spread of EEE. But are current practices effective? Large areas of eastern and central Massachusetts have been sprayed from fixed-wing aircraft with a broad-spectrum insecticide and adjuvant (Anvil 10+10 and PBO) to kill the mosquitos that transmit EEE. From the ground, roadside fogging from trucks is done with the same goal.

If this spraying is effective in reducing the incidence of human disease, then it has to be done despite the environmental damage it also causes. However, the state has neither studied nor implemented via adaptive management alternative strategies for mosquito control. Because the efficacy of current practices is unknown, the state is merely giving its citizens a false sense of security, wasting taxpayer dollars, and potentially harming populations of beneficial insects, including predators that eat mosquitos.

In fact, we do not know that either roadside spraying or aerial spraying in Massachusetts is reducing the incidence of human disease. The 2019

Arbovirus Surveillance Plan states "Aerial applications cannot and do not eliminate risk and must not be viewed by the public or municipalities as a solution to EEE risk...." Few members of the public, politicians or even journalists have read this statement.

We don't know if, where or when aerial spraying works because apparently the research needed has not been done. The research needed must be done locally, because the literature clearly shows that the effectiveness of mosquito control methods depends heavily on many factors that vary greatly among locations. Suburban and rural Massachusetts are not at all like suburban Houston, Sacramento or Miami where some research has been done on the effectiveness of aerial spraying. I can find nothing in the scientific literature about the efficacy of roadside spraying as it is done in Massachusetts.

Because the ultimate source of EEE is mosquitos living in tree-covered swamps, sampling must be done there in a before-after, control-impact experiment (BACI) to determine if spraying is effective in reducing vector abundance for any period of time. Reductions in the abundance of mosquitos may not be occurring as the public expects, because even in open areas like Sacramento, small insects were found dead on the white sheets laid out to collect the insects killed, but no dead mosquitos were found on them (see Boyce et al., 2007, Journal of the American Mosquito Control Association, Vol. 23, pages 335-339).

In heavily forested areas like much of Massachusetts, with planes flying at 300' above ground, I wonder to what extent the spray is penetrating the forest canopy and subcanopy to reach where mosquitos are seeking blood meals. Also, spraying is done under a variety of weather conditions. Consequently, the effectiveness of the spray is expected to be highly variable in space and time. So, the Surveillance Plan is correct to emphasize the importance of individual protection from mosquito bites, and the public is justified in wondering if their tax dollars have been spent for nothing.

The state should be doing the research needed to assess the efficacy of their current mosquito surveillance and control actions. We are currently using the same methods developed and used in the 1940s to control mosquitos. The only difference is that we now use insecticides that are less directly harmful to people and their pets. Rachel Carson warned us about the dangers of broad-spectrum insecticides, but the Commonwealth has no other options, because it has not done or funded the essential research.

Numerous candidate means of control - alternatives to spraying with broad-spectrum insecticides -- are being developed and tested elsewhere. I was able to find many relevant studies in a few minutes by using Google Scholar. Here are some examples "Wolbachia-Based Interventions in an IVM Framework" (Niang et al. 2018), "The role of spiders as biological

control agents" (Ndava et al. 2018), "A fungal pathogen deploys a small silencing RNA that attenuates mosquito immunity and facilitates infection" (Cui et al. 2019), "Sterile Insect Technique in an Integrated Vector Management Program against Tiger Mosquito" (Tur et al. 2021), etc., etc..

It is essential to determine why and how EEE is spreading and to clarify the conditions that promote transmission to mosquitos that seek humans. This report and an extensive search of the scientific literature reveal that this is not being done. It is very helpful that we have long-term monitoring of mosquitos in the swamp forests where the cycle is maintained, but that information needs to be used to develop effective control methods that do not cause environmental harm.

To any critical observer, the control actions taken at present are at best ineffective and potentially harmful to the major checks on mosquito abundance - their invertebrate predators.

Last, the report notes that: "Community outreach is a core principle for IPM". Establishing and maintaining "public trust by providing accurate, timely, and actionable information to the public to inform communities of potential disease risk and prevention strategies" is essential, and such communications should contain adequate information to dispel rumors and misinformation (American Mosquito Control Association, 2017). I agree completely with these statements, but at present community outreach is completely misses 99% of those potentially affected, meaning that "accurate, timely, and actionable information" is unavailable to the public and therefore unable to dispel rumors and misinformation.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 6:02 pm
Browser:	Chrome Mobile 93.0.4577.82 / Android
IP Address:	108.7.47.69
Unique ID:	861892942
Location:	42.395500183105, -71.181602478027

Name	Judith Sheldon
Subject:	Mosquito Control: Please do not spray
Comments:	The state-commissioned report found no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 6:05 pm
Browser:	Chrome Mobile 93.0.4577.82 / Android
IP Address:	108.7.47.69
Unique ID:	861893635
Location:	

Name	Judith Sheldon
Subject:	Mosquito Control: Please do not spray
Comments:	The state-commissioned report found no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 6:15 pm
Browser:	Chrome 93.0.4577.82 / Windows
IP Address:	161.77.227.136
Unique ID:	861896724
Location:	42.587600708008, -72.599502563477

Name	Mary Lou Conca
Subject:	Protest Mosquito Spray
Comments:	I protest with force-the spraying of chemicals to kill mosquitos! The spraying of these pesticides will kill more than mosquitos, possibly causing cancer in humans, so please stop this activity! Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 7:38 pm
Browser:	Mobile Safari 14.0.2 / iOS
IP Address:	75.131.72.133
Unique ID:	861916231
Location:	44.876098632812, -73.417098999023

Name	Dori Rhodes
Organization / Affiliation:	Cornerstones Early Childhood Development
Subject:	Pesticides
Comments:	I am opposed to the spraying of pesticides!!! Not only are they harmful to humans but they destroy our ecosystem! The effects are seen on our bee population, hummingbirds, and butterflies. The birds are affected as well. Think about this for a minute and the ripple effect and which it has. When pesticides are sprayed into the air, not only does it pollute the air we breathe but it to settles into the soil, this means it affects local crops. As much as I despise getting bitten by mosquitoes,I am opposed! The future ramifications are unknown and far scariest than a few bites.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 11:00 pm
Browser:	Mobile Safari 14.0.2 / iOS
IP Address:	98.216.124.61
Unique ID:	861954920
Location:	42.813499450684, -70.886001586914

Comments:

Please find other ways to help control the mosquitoes, but toxic sprays are bad for the whole environment. We already have the data! Now we need to act appropriately. Thank you

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 11:37 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	70.109.135.7
Unique ID:	861960856
Location:	

Name	Martha Rullman
Subject:	Concerned about state Mosquito Control program
Comments:	I am extremely concerned about the state's approach to mosquito control management using broad dispersal of toxic pesticides. The state's provision allowing communities to implement alternative "opt out" plans has also been disingenuous and is really aimed at taking away local control. In a time when climate change, insect decline, polluted private and public water supplies, and public health risks are a growing concern, the state's approach to blanketing communities with toxic chemicals to combat arboviruses just does not make sense. The approach of aerial spraying to control mosquito populations has been shown to be ineffective, and the long term effects of this strategy are disastrous. Organic farmers, gardeners, and beekeepers are at risk, and the effects on beneficial insects and other species that depend on them will suffer untold consequences. I will add that my husband and I have invested a lot in conserving our land to protect the forests, water and wildlife. Because of the shortsighted and misguided mosquito control policy with expanded use of aerial spraying, we now have to wonder what is the point if the state implements aerial spraying which ultimately render our efforts essentially pointless. I urge the state Mosquito Control Task Force to adopt science based policies that take into account the fact that we simply cannot afford indiscriminate spraying of these toxic chemicals. Thank you. Martha Rullman Northfield, MA

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 17, 2021 11:57 pm
Browser:	Chrome 93.0.4577.63 / Windows
IP Address:	70.109.135.7
Unique ID:	861963933
Location:	44.647499084473, -72.690101623535

Name John Schuster

Comments:

I would like to begin with a quote from the well known entomologist and author Doug Tallamy:

"The big problem today, of course, is that insects are declining," Mr. Tallamy said from Delaware in a recent interview. "And that is: we say 'declining' - we're killing them. That's why they're declining.

"We've had this war against insects forever, and now we're recognizing that we have global insect declines, and that becomes a serious problem. To make a long story short, humans will not survive on the earth without insects. So, we absolutely need them. Not just for pollination, but because they create the ecosystem services that support us."

And if insects are lost due to the overuse of pesticides, most birds will be lost as well, he added."

Many residents of Massachusetts, and all over the country, have become aware of how serious are the declines in bird and insect populations, not to mention amphibians, reptiles and bats. In the context of the global assault on these wonderful and essential creatures, they have awoken to the importance of taking immediate action in their own backyards. Professor Tallamy and others have been instrumental in teaching people how much of a difference they can make by simply managing their own property to eliminate toxic chemicals and planting native species of wildflowers, trees and shrubs. It is empowering to know that as an individual we can make a significant difference locally, We may not be able to protect a migratory bird on it's increasingly perilous journey, but if we can provide suitable nesting habitat and help that bird to successfully raise a clutch of nestlings to fledging, then we have done something of profound significance.

My wife and I, along with so many of our neighbors, are horrified and angered by the State's intrusion into the sanctity of our private property where we are endeavoring to make whatever meaningful difference we can in the face of the tragic reality of global extinction.

We do not want toxic pesticides used anywhere near our property which includes Core Habitat supporting Ste listed species. Today however, every scrap of habitat is Core Habitat, and every species is a State Listed species. We don't want these toxic chemicals used anywhere else either. The single exception would be a legitimate public health emergency.

We support legislation H. 937 and S. 556 to establish an ecologically based mosquito management program to provide for public health with minimum impact to the natural world on which we all depend.

John Schuster
Northfield, MA

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 18, 2021 9:30 am
Browser:	Chrome 90.0.4430.86 / Chrome OS
IP Address:	73.100.94.223
Unique ID:	862047881
Location:	

Comments:

There should be more public announcements about what homeowners should do to eliminate standing-water mosquito breeding.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 18, 2021 4:13 pm
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	71.234.176.223
Unique ID:	862132415
Location:	

Name	Susan McGinn
Subject:	oppose expanded pesticide spraying and to support ecologically based management mosquito control focused on protection of human health and the environment.
Comments:	The Mosquito Control Task Force Report - August 2021 confirms that there is no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Yet despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 18, 2021 4:15 pm
Browser:	Chrome 93.0.4577.82 / OS X
IP Address:	71.234.176.223
Unique ID:	862132714
Location:	

Name	Susan McGinn
Subject:	I oppose expanded pesticide spraying
Comments:	I oppose expanded pesticide spraying and support ecologically based management mosquito control focused on protection of human health and the health of the natural environment. The Mosquito Control Task Force Report - August 2021 confirms that there is no quantifiable evidence that the current practices, which include routine spraying of pyrethroid pesticides, are effective in reducing mosquitoes or mosquito-borne diseases. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Yet despite the lack of data on effectiveness, the report claims that reducing spraying could increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. There are more effective ways to reduce the risk of WNV and EEE - including personal protection measures, eliminating artificial breeding areas like discarded tires, and restoring wetlands and rivers to increase access by fish and other mosquito predators to natural breeding habitat.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 18, 2021 4:31 pm
Browser:	Chrome 93.0.4577.82 / Windows
IP Address:	174.83.53.21
Unique ID:	862135427

Name	Judith Cmero
Organization / Affiliation:	Springfield Garden Club
Subject:	Toxic Mosquito Control
File	https://massgov.formstack.com/admin/download/file/11371479380

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 18, 2021 8:26 pm
Browser:	Chrome 93.0.4577.63 / OS X
IP Address:	146.115.151.33
Unique ID:	862172692
Location:	42.369899749756, -71.235298156738

Name	Lauren Eggbeer
Subject:	More Science
Comments:	I fully believe that the state can put the state's resources to better use by employing mosquito control methods that are rooted in ecological restoration, rather than statewide spraying as the default. Through science-based, ecological restoration approaches, we can still meet our goals of reducing the danger of disease, while also strengthening the nature-based solutions that we know are a win-win for our climate and communities.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 18, 2021 9:29 pm
Browser:	Firefox 92.0 / Windows
IP Address:	47.14.4.137
Unique ID:	862183055
Location:	

Name	Sharon McCarthy
Organization / Affiliation:	Harvard Board of Health
Subject:	Mosquito Control Spraying
Comments:	Harvard submitted an opt-out application, which was denied. We were told this was because EEA considered the town to be a moderate risk. This information was known to EEA before the application was submitted as it was based on the prior year's data. This information was NOT made available to the town prior to the submittal of the opt-out application. The Board of Health strongly disagrees with EEA's logic for making the decision as well as its full blown acceptance that spraying pyrethroid pesticides is the only way to protect public health from arborviruses. These chemicals are highly toxic to bees, fish, and many other beneficial species, and pose health risks to people too. Despite the lack of data on effectiveness, the report claims that reducing spraying would increase cases of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE). This analysis is deeply flawed, and fails to address the economic, ecological, and human health impacts of these toxic chemicals. Harvard's application emphasized other approaches including personal protection measures & eliminating artificial breeding areas like discarded tires. Our application also presented data on the forest canopy in our town and how ineffective aerial spraying will be under such environmental conditions.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 19, 2021 2:47 pm
Browser:	Firefox 78.0 / OS X
IP Address:	72.92.128.30
Unique ID:	862356634
Location:	

Name	j w
Comments:	please use ecological methods of controlling mosquitos and not pesticides that harm bees and other living things. there are proven ways to deal with west nile and other mosquito spread illnesses. spraying pesticides goes against everything i believe in and i see it as an act of violence against nature and people. thanks for your time and consideration.

PUBLIC COMMENTS RECEIVED

September to November 2021

The Commonwealth of Massachusetts
MASSACHUSETTS SENATE

SENATOR JO COMERFORD
Hampshire, Franklin and Worcester District

STATE HOUSE, ROOM 413C
BOSTON, MA 02133-1053
TEL. (617) 722-1532
WWW.MASENATE.GOV

Chair
JOINT COMMITTEE ON PUBLIC HEALTH

Chair
JOINT COMMITTEE ON COVID-19 AND
EMERGENCY PREPAREDNESS AND MANAGEMENT

November 3, 2021

Local Engagement Subcommittee
Mosquito Control for the Twenty-First Century Task Force
% Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: Mosquito Spraying Opt-out Process

Dear Local Engagement Subcommittee,

I am very grateful for your work and service.

I write however today with a great deal of frustration on the part of municipalities in my district and other parts of the Commonwealth over the spraying opt-out process and to communicate to you the depth of challenge the small rural towns in my district experienced when trying to engage with EEA in the process.

In my district there were a number of applications approved and a number denied. All of the denied applications were from towns judged to be in a region with a moderate level of risk to public health caused by Eastern Equine Encephalitis (EEE) as determined by EEA, while all the approved applications were from communities judged as having a lower regional risk. This gave the impression that the regional risk level, and not anything written in the municipality's opt-out application, was the key factor in the state's decisions.

Beginning in the summer of 2020, I along with my colleagues repeatedly asked for the opt-out process to be noticed, as well as for the opt-out criteria to be made clearer. I indicated strong interest in the process and sought information to support engagement and to build local communities' capacity to participate effectively.

I saw the painstaking work in each community regarding the decision to seek to opt out, as well as the work to build a viable alternative plan, particularly with consideration to competing priorities related to the COVID-19 pandemic. I share the extreme frustration of my constituents.

Towns put their limited resources into developing opt-out applications, only to see their applications denied because of the assigned regional risk level. If the state was going to deny applications based on regional risk level, it should have saved these towns the trouble of applying. If the submitted alternative plans were deemed insufficient, they should allow towns to learn what standards EEA was looking for, and then be given a chance to amend their plans. We share the extreme frustration of many localities across the state.

For example, communities were challenged by a lack of guidance on what constituted an acceptable alternative plan. We heard from a number of communities with questions and concerns about the public education and outreach component being the only portion of an alternative plan required by EEA. Communities were not clear on whether applications that only included public education and outreach measures were sufficient to be considered. In fact, we received guidance that indicated extensive public education around prevention measures was an appropriate and acceptable emphasis for municipal opt-out applications.

Again, both municipalities and my team requested detailed guidance but EEA did not provide such guidance, nor did they describe the extent to which risk level would be determinative.

I urge the Task Force to closely examine this year's process and make strong recommendations for a total revamp of the process. In particular, I urge the Task Force to make available clear standards long before the submission deadline, and to provide extensive assistance to cities and towns seeking to apply for a local opt-out. The process should allow for detailed communication and feedback following the submission of an application, including an opportunity to amend submissions. The goal, consistent with the legislation, should be to maximize local choice and control over spraying within each community.

I thank the Task Force, the Local Engagement subcommittee, and the agencies working hard to implement the law for their close attention to our comments about the process and those submitted by other cities and towns.

Sincerely,

Jo Comerford
State Senator
Hampshire Franklin Worcester district

November 2, 2021

To: the Massachusetts Mosquito Control for the Twenty-First Century Task Force, and its Local Engagement subcommittee

Re: Comments on the MA mosquito spraying opt-out process and general mosquito vector surveillance in the state

Hello Task Force and Subcommittee Members,

As chair of the local board of health in Whately, MA, I authored our mosquito spraying opt-out document earlier this year. Though our opt-out plan was accepted by the Executive Office of Energy and Environmental Affairs (EEA), any process guidance and standards for what would be considered acceptable as an alternate mosquito plan were almost entirely lacking.

Despite repeated entreaties for clarification by multiple communities in the Commonwealth wishing to opt-out, the EEA never really replied. We submitted our plans with no concrete information about the minimum criteria for acceptance. It was truly sad and unfortunate, to say the least, especially for those communities whose opt-out applications where rejected.

This process must be reformed and revamped from the top down. As a result of the fiasco cited above, I would go so far as to suggest that the responsibility for mosquito control in MA should be transferred from the EEA to a more responsive MA Department of Public Health which is ultimately where disease control belongs.

Further, the current mosquito vector surveillance system in MA is very fragmented and totally absent in a large part of the state, notably western MA. Many small communities lack the staff and/or the resources to conduct such surveillance. Small rural towns often don't join a "mosquito control district", even if one is nearby, due to the limited level of surveillance they provide. Mosquito district vector sampling is uneven at best and has an additional cost per sample to the individual towns on top of the basic district membership fees.

Thus, I would like to suggest that the Task Force seriously look into requesting funding for a uniform state-wide mosquito vector surveillance system for the entire Commonwealth using ARPA funds, or other monies earmarked for public health. Such a system would replace the deficient individual town or mosquito district surveillance and equitably standardize mosquito vector surveillance with more precise data.

Lastly, I commend the Task Force tackling the whole issue of arbovirus control and management with a sorely needed eye towards more ecologically sound approaches and alternatives to spraying. I look forward to your response to my suggestions. Thank you.

Sincerely,

Francis Fortino, Chair, Whately Board of Health (413-665-4561)

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	September 24, 2021 9:52 am
Browser:	Chrome 92.0.4515.131 / OS X
IP Address:	162.245.141.122
Unique ID:	865155474
Location:	42.474498748779, -72.487396240234

Name	Owen Wormser
Subject:	Aerial spraying for mosquitos is ecologically irresponsible!
Comments:	Spraying wide expanses of pesticides from the air to control mosquitos has a wide ranging and detrimental impact on other insect species as well, including pollinators. It is grossly misguided to continue aerial spraying and I encourage the state to look at more balanced approaches that won't wreak havoc on an already challenged ecosystem. Thanks for your consideration, Owen Wormser

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	October 29, 2021 5:55 pm
Browser:	Chrome 95.0.4638.69 / Windows
IP Address:	162.245.141.77
Unique ID:	879976922
Location:	

Name	Tom Hankinson
Organization / Affiliation:	Town of Leverett/Select Board Member
Subject:	Mosquito Spraying Program and Opt-Out Option
Comments:	The Town of Leverett was identified in 2021 as presenting a moderate risk to public health due to the presence of undisclosed [and possibly undetermined] EEE risk factors. Quoting from a letter to our representatives from Kathleen Theoharides, Secretaroy to Governor Baker, "An education and outreach plan was the only component required for a municipality to be considered as part of the process. However, it was explicitly articulated that this was a minimum requirement for an application. As identified in the regional risk scale above, the quality of a submitted plan is a notable factor in determination of regional risk in communities with higher prevalence of historical EEE risk factors." Unfortunately, criteria of a submitted plan that the state might judge to be of high quality were never articulated prior to the application deadline, nor were they articulated as reasons Leverett's submitted plan was judged incapable of managing the state's perceived risk of EEE in Leverett. A more detailed EEE risk analysis of the Town of Leverett would have provided the town a better opportunity to genuinely reduce public health risk AND construct a high quality mosquito spraying opt-out plan. If, indeed, there exists an analysis of EEE risk for Leverett, the town would be very interested in reviewing it for our own public health efforts. And if such an analysis does not exist I would be interested in learning how the state arrived at a risk level of "moderate" for the town. Thank you, Tom Hankinson Select Board

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	October 29, 2021 10:43 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	174.192.6.38
Unique ID:	880035746
Location:	

Name	Mandy Mallet
Comments:	We are all very concerned about the thought of chemicals being sprayed to control mosquitoes. Please don't spray chemicals. It will effect our organic crops and we are a right to farm community. Thank u

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	October 31, 2021 6:52 am
Browser:	Firefox 93.0 / Windows
IP Address:	24.62.200.57
Unique ID:	880318714
Location:	

Name	Stephen George
Organization / Affiliation:	Amherst Board of Health (writing as one member, not necessarily on behalf of the whole Board)
Subject:	Frustration with the opt-out process
Comments:	The Amherst Board of Health developed an application to opt out of widespread spraying, after reviewing all available information and formulating a plan that seemed to cover all requirements. The application was approved by the Town Council and submitted on time by the Town. However, the application was summarily rejected without any substantive explanation for the reason for the rejection. At the very least, rejected applicants should be told what was wrong with their application.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	November 2, 2021 8:00 pm
Browser:	Firefox 93.0 / Windows
IP Address:	24.60.191.101
Unique ID:	881496723

Name	Francis Fortino
Organization / Affiliation:	Whately Board of Health
Subject:	opt-out process and state mosquito surveillance
Comments:	See comments in attached file.
File	https://massgov.formstack.com/admin/download/file/11631638831

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	November 3, 2021 1:34 pm
Browser:	Chrome 94.0.4606.81 / OS X
IP Address:	50.220.97.90
Unique ID:	881855497
Location:	

Name	Morning Star Chenven
Organization:	Erving Conservation Commission
Affiliation	Government
Subject:	Mosquito Control
Comments:	I am a member of the Erving Conservation Commission, fairly new in this position. Our Commission does not support mosquito spraying that can damage invertebrates such as dragonflies and that can possibly be toxic to other natural resources. We would like timely information on how the town can opt out of the process. And we would like more information on the spraying process (time, products, procedure) in our town and region. We are willing to be of any support we can to the creation/promotion of alternatives to spraying.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	November 3, 2021 1:39 pm
Browser:	Chrome 95.0.4638.69 / Windows
IP Address:	216.193.169.128
Unique ID:	881858336

Name	Senator Jo Comerford
Organization:	Massachusetts State Senate
Affiliation	Government
Subject:	Feedback for the Local Engagement Subcommittee re: Mosquito Spraying Opt-out Process
Comments:	(see attached)
File	https://massgov.formstack.com/admin/download/file/11636190690

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	November 3, 2021 6:32 pm
Browser:	Chrome 95.0.4638.69 / Windows
IP Address:	216.193.164.13
Unique ID:	882013794
Location:	

Name	Barbara Craddock
Organization:	Town of Wendell Board of Health
Subject:	Suggestions for Mosquito Control Task Force
Comments:	Our Board of Health suggests the following: 1. Allow more time to complete the Application 2. Include more specificity regarding requirements. For example, exactly what is expected in the way of mosquito surveillance? 3. Provide an example of what you consider a "strong" response. 4. If possible, provide resources and contact information if outsourcing for certain services becomes necessary. You may share these comments with Local Engagement subcomiittees as well as the entire Task Force. Thank you for your attention. Barbara Craddock Town of Wendell Board of Health

PUBLIC COMMENTS RECEIVED

November 2021 to February 2022

CAS Reg. No.	Ingredient Name	Use
75-37-6	1,1-Difluoroethane (Commodity Inert Ingredient)	Food and Nonfood Use
811-97-2	1,1,1,2-Tetrafluoroethane	Food and Nonfood Use
9002-84-0	Teflon	Food and Nonfood Use
29118-24-9	Trans-1,3,3,3-tetrafluoroprop-1-ene	Food and Nonfood Use
131324-06-6	Poly(difluoromethylene), alpha-chloro-omega-(1-chloro-1-fluoroethyl)-	Nonfood Use Only
1320-37-2	Dichlorotetrafluoroethane	Nonfood Use Only
163440-89-9	Poly(difluoromethylene), alpha-(2,2-dichloro-2-fluoroethyl)-omega-hydro-	Nonfood Use Only
188027-78-3	5H-1,3-Dioxolo[4,5-f]benzimidazole, 6-chloro-5-[(3,5-dimethyl-4-isoxazolyl)sulfonyl]-2,2-difluoro-	Nonfood Use Only
24937-79-9	Ethene, 1,1-difluoro-, homopolymer	Nonfood Use Only
25067-11-2	Hexafluoropropene, polymer with tetrafluoroethylene	Nonfood Use Only
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane	Nonfood Use Only
65530-66-7	Poly(difluoromethylene), .alpha.-fluoro-.omega.-[2-[(2-methyl-1-oxo-2- propenyl)oxy]ethyl]-	Nonfood Use Only
65530-85-0	alpha-(Cyclohexylmethyl)-omega-hydropoly(difluoromethylene)	Nonfood Use Only
65545-80-4	Poly(oxy-1,2-ethanediyl), alpha-hydro-omega-hydroxy-, ether with alpha-fluoro-omega-(2-hydroxyethyl)poly(difluoromethylene) (1:1)	Nonfood Use Only
354-33-6	Ethane,1,1,1,2,2-pentafluoro-	Nonfood Use Only
42557-13-1	Poly(oxy(methyl(3,3,3-trifluoropropyl)silylene)), alpha-(trimethylsilyl)-omega((trimethylsilyl)oxy)-	Nonfood Use Only
431-89-0	Propane, 1,1,1,2,3,3,3-Heptafluoro-	Nonfood Use Only
593-70-4	Fluorochloromethane	Nonfood Use Only
63148-56-1	Siloxanes and silicones, Me 3,3,3-trifluoropropyl	Nonfood Use Only
67786-14-5	2-Naphthalenesulfonic acid, 6-amino-4-hydroxy-5-{{2-(trifluoromethyl)phenyl}azo}-, monosodium salt	Nonfood Use Only
79070-11-4	Poly(difluoromethylene), .alpha.-chloro-.omega.-(2,2-dichloro-1,1,2-trifluoroethyl)-	Nonfood Use Only
88795-12-4	1-Butanol, 4-(ethenyloxy)-, polymer with chlorotrifluoroethene, (ethenyloxy)cyclohexane and ethoxyethene	Nonfood Use Only
-	Montmorillonite-type clay treated with polytetrafluoroethylene	Nonfood Use Only
-	Partially fluorinated alcohol, reaction products with phosphorus oxide (P2O5), ammonium salts; (Not to exceed 0.1% by weight as an additive in antimicrobial paint products)	Nonfood Use Only
88485-37-4	Fluxofenim (as a safener)	Nonfood Use Only

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	December 10, 2021 2:42 pm
Browser:	Chrome 96.0.4664.55 / Windows
IP Address:	73.159.161.244
Unique ID:	898540372
Location:	

Name	Paul Beaulieu
Organization:	Trout Unlimited - Massachusetts Council
Affiliation	NGO/Community Group/Non-profit
Subject:	Spraying near Trout Streams
Comments:	Can the task force look into measures to limit chemical spraying (or other forms of application) near cold-water fisheries? Seems contrary to good practice to apply chemicals that may be impacting streams into which Massachusetts spends considerable time and money stocking with trout (not to mention the potential impact to wild trout populations). -Paul G. Beaulieu

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	December 20, 2021 8:18 am
Browser:	Safari 14.1.1 / OS X
IP Address:	8.2.72.21
Unique ID:	904078453
Location:	

Name	Nancy Hazard
Organization:	Greening Greenfield
Affiliation	NGO/Community Group/Non-profit
Subject:	Controlling Mosquitos - H.937/S.556
Comments:	Please recommend NO spraying!! I am very concerned about the 80% decline of insects in Europe over the past 50-years! As E.O. Wilson notes: "If insects were to vanish, the environment could collapse into chaos" Below is a science-based approach to controlling mosquitoes by Dr. Tallamy, an entomologist and professor at U Maryland. This passage is from his book Natures Best Hope. "The pyrethroid-based insecticides used by mosquito foggers indiscriminately kill all insects, not just mosquitos. Ironically, targeting adult mosquitoes is the worst and by far the most expensive approach to mosquito control, because mosquitoes are best controlled in the larval stage." Advice: put a five-gallon bucket of water in a sunny place in our yard and add a handful of hay or straw. After a few days, the resulting brew is irresistible to gravid (egg0filled) female mosquitoes. After the mosquitos have laid their eggs, add a commercially available mosquito dunk tablet that contains Bacillus thuringiensis (Bt), a natural larvicide, to your bucket. The eggs will hatch and the larvae will die. This way you can control mosquitos, and only mosquitos, without the use of harmful insecticides." Thank you for listening, and your work

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	December 20, 2021 12:17 pm
Browser:	Firefox 91.0 / OS X
IP Address:	8.2.72.116
Unique ID:	904187894
Location:	

Name	Carol Letson
Subject:	Mosquito Control by spraying
Comments:	Dear Mosquito Control Task Force, I call on you to rethink and redesign the state's response for mosquito control. The poisons that will be sprayed over outdoor acres will call ALL insects, not just mosquitos. This outcome will be disastrous to our wildlife. Sprayed poisons will not have a positive outcome overall. Please carefully consider alternative programs to get rid of standing water in piles of old tires, in abandoned building foundations, in drainage ditches. Overall spraying the surface of the earth will lead to human and animal health issues. Thank you, Carol Letson Greenfield, MA

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	December 20, 2021 5:12 pm
Browser:	Firefox 91.0 / OS X
IP Address:	72.93.26.15
Unique ID:	904314891

Name	Clint Richmond
Organization:	Mass. Sierra Club
Affiliation	NGO/Community Group/Non-profit
Subject:	PFAS/Fluorinated inert ingredients in pesticides
Comments:	Thank you for the opportunity to present at the to the Task Force on Dec. 14 on the subject of "PFAS in Pesticides". In my presentation, I mentioned Inert ingredients but did not discuss them in detail. I would like to provide some detail now. Attached is a list of 25 EPA-registered inert ingredients approved for pesticides. We do not know which have been used or are still being used, but it demonstrates the problem that these compounds could conceivably be used in any pesticide. Many of these chemicals have multiple applications including in food contact materials so any environmental contamination could come from various sectors. This list was generated from: https://ordspub.epa.gov/ords/pesticides/f?p=INERTFINDER:1::::1::
File	https://massgov.formstack.com/admin/download/file/11935820471

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	January 21, 2022 2:12 pm
Browser:	Chrome 97.0.4692.71 / OS X
IP Address:	75.69.137.28
Unique ID:	915780105
Location:	

Name	Lisa Rigsby
Affiliation	Private Citizen
Subject:	Important Legislative Briefing - Task Force Should Attend
Comments:	I didn't hear mention of the upcoming legislative briefing at the last meeting. I may have missed it or it may have not been scheduled at the time of the last meeting. I hope that task force members are able to attend this important and relevant briefing. Registration is required: https://us06web.zoom.us/meeting/register/tZUsfuyoqjMtE9OOK8p61Ww6JC4DtBn8DdoD Thank you, Lisa Rigsby Legislative briefing: Ecologically Sound Mosquito Control (S.556/H.937) Description Proposed legislation, filed by Rep. Dr. Tami Gouveia, Sen. Adam Hinds and currently before the ENRA committee, replaces the Commonwealth's outdated and expensive mosquito management system with one that is more effective, affordable, transparent, ecologically responsible, and scientifically based. Subject Matter Experts at this legislative briefing will include: Dr. Kyla Bennet, Public Employees for Environmental Responsibility (PEER) Dr. Flaminia Catteruccia, Harvard T.H. Chan School of Public Health Dr. Brita Lundberg, Greater Boston Physicians for Social Responsibility Sarah Hoyle, Xerces Society for Invertebrate Conservation Topics will include: the scientific basis for ecological mosquito disease control, adverse impacts of spray-based approaches on humans and non-target organisms

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	January 27, 2022 2:47 pm
Browser:	Firefox 96.0 / Windows
IP Address:	24.60.175.48
Unique ID:	923671255
Location:	

Name	Geoffrey Day
Organization:	Sea Run Brook Trout Coalition
Affiliation	NGO/Community Group/Non-profit
Subject:	Please support scientific approachs on mosqito control

Comments:

Has anyone noticed the lack of fireflies in the summer nights? How about the increasing lack of birds in all seasons? Does anyone notice fewer instances of acquiring bugs in one's automobile grille or on one's windshield on a summer night?

Presumably this - and many other things -- are lost when "mosquito control" spraying happens.

But is anyone actually paying attention as to how many bugs ARE NO LONGER THERE when they once were?

Of course, brook trout, bees, and many other creatures such as bats, bluebirds and barn swallows also seem to be disappearing in front of our very eyes - that is, if we are able to see things that are no longer there.

Some fly fishers have noticed there aren't as many hatches of water-borne insects as there once were. While this may be disappointing to an angler - it can be deadly to insectivores - and in some cases it can cause an entire population of fish to die out.

Ecologically, everything is connected. Each of the examples above may be caused by state mosquito control - or something else. Does anyone actually know?

I well understand that mosquitos are more than just forage and nuisance insects in that they can be a true threat to public health as the can be vectors for infectious insect borne diseases such as West Nile virus and Eastern Equine Encephalitis.

Please think of the fish, the birds, and ALL the insects as well as the humans that depend on these things when considering spraying for mosquito control, and please consider it critical that research be funded and new approaches be developed.

I applaud the efforts of the MASSquito Coalition and strongly support their position of advocating for ecologically sound mosquito disease management programs.

I thank you - and the fish thank you too.

Sincerely,

Geoffrey Day
Sea Run Brook Trout Coalition
Newburyport MA
www.searunbrookie.org

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 3, 2022 4:15 pm
Browser:	Chrome 97.0.4692.71 / OS X
IP Address:	71.192.180.150
Unique ID:	926509521
Location:	

Name	Elizabeth McNerney
Organization:	Mothers Out Front (not as an official organizational voice)
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Best Practices
Subject:	Environmental safety and public health are not well served with spraying
Comments:	Hello Mosquito Control Task Force & SubCommittee -- thank you for the opportunity to comment. The toxic load in our environment, and our bodies, is substantial and the effects are only, very, partially known. We did what we thought was best to kill mosquitoes because they brought risk of disease - and they still do. However, our understanding of the extremely adverse "ripple effects" of broadly spraying chemicals designed to kill, even something as small as a mosquito, is growing and our practices must change too. Please put mosquito control back on the ground and in the hands of well-trained & thoughtful people.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 3, 2022 8:25 pm
Browser:	Firefox 96.0 / OS X
IP Address:	174.242.72.34
Unique ID:	926590108
Location:	

Name	John Root
Organization:	Pollinate Amherst
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Best Practices
Subject:	Support of S.556 and H.937
Comments:	I support an improved mosquito management system that is effective, affordable, transparent, ecologically responsible, and scientifically based, and believe that S.556 and H.937. This bill will accomplish these goals through the following steps: 1. Creates a Mosquito Management Board with a membership that will prioritize public health and the environment. 2. Requires a state mosquito management plan that must adopt a step-by-step approach to management based on quantifiable thresholds for action. Pesticides may not be used unless education, monitoring, and habitat modification have already been attempted. 3. Allows pesticide use only for disease control; and prohibits aerial application of pesticides. 4. Keeps the existing mosquito control districts but requires districts to adopt the ecological approach to mosquito management described above. 5. Empowers towns and cities to choose from a "menu" of mosquito management services, ranging from public education up to pesticide use. Municipalities only pay for the services they choose, in contrast to the existing one-size-fits-all system that forces municipalities to pay the full cost of being in a district even if they don't want certain services, like pesticide spraying. 6. Requires 72 hour notice before pesticide spraying, and allows residents to opt out of spraying. Beekeepers and organic farmers are opted-out by default. 7. Establishes quantifiable conditions for declaring an arbovirus public health emergency and puts responsibility for responding to the emergency with the department of public health. Aerial spraying is still prohibited during a state of emergency. 8. Bans pesticides containing PFAS from being used in mosquito control activities.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 4, 2022 3:28 pm
Browser:	Firefox 96.0 / OS X
IP Address:	75.68.204.180
Unique ID:	926918779
Location:	

Name	Joyce Palmer Fortune
Organization:	Whately Selectboard
Affiliation	Government
Subcommittee to which your comment pertains	Policy Structure
Subject:	local opt out
Comments:	Please make it easier for local communities to opt out, especially for aerial spraying and pesticide application. Folks at the local level can make better informed decisions about pesticide use, especially in towns where agriculture is a big part of the economy, and areas with a lot of sensitive habitat. Our hard working conservation commissions should not be overburdened with an onerous opt out process.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 5, 2022 11:42 am
Browser:	Safari 15.3 / OS X
IP Address:	47.14.4.152
Unique ID:	927133434
Location:	

Name	J Panek
Subcommittee to which your comment pertains	Policy Structure
Subject:	opting out of pesticide applications
Comments:	It is apparent that the current regulations on mosquito control are woefully out of date. I am especially concerned that towns do not have the choice to completely prevent spraying of pesticides for adult mosquitos. To protect our environment and all the beneficial insects and wildlife that depend on them, towns, conservation organizations, and individuals should be able to reject all pesticide spraying. It would be even better if spraying everywhere was an 'opt-in' so that pesticide use requires a specific choice. We have to stop trying to kill our way out of environmental problems.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 5, 2022 8:40 pm
Browser:	Mobile Safari 14.1.2 / iOS
IP Address:	75.67.194.246
Unique ID:	927226799
Location:	

Subcommittee to which your comment pertains	Pesticide Selection
Comments:	Please stop spraying pesticides! Wake up, they do more harm then good to humans!!!!! The evidence shows spraying doesn't do what it's intended and causes direct harm. It's time to put an end to this practice. Know better, do better.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 6, 2022 5:51 am
Browser:	Mobile Safari / iOS
IP Address:	66.31.174.66
Unique ID:	927284307
Location:	

Name	Lydia Gauquier
Subcommittee to which your comment pertains	Best Practices
Subject:	Stop Toxic Spraying for Mosquitoes
Comments:	Please consider alternative methods to spraying potentially toxic and forever chemicals. Please choose a newer, greener method, and do your best to avoid further pollution of rivers and wildlife.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 6, 2022 4:36 pm
Browser:	Safari 15.2 / OS X
IP Address:	47.14.67.229
Unique ID:	927408109
Location:	

Name	David durrant
Affiliation	Agriculture
Subcommittee to which your comment pertains	Best Practices
Subject:	Spraying
Comments:	I do not think ANYTHING should be used for spraying and controlling mosquitos. I have never sprayed in the 40+ years I have been stewarding my land. My barn swallows (as well as other birds) control the mosquitos better than we ever will. In the summer we can eat out everyday because there are not many mosquitos around thanks to our natural predators. We as a nation are dumping too many unattractive and toxic substances into our environment and it is time we stopped. Mosquito (" control" ?) companies should also be banned.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 10:53 am
Browser:	Opera 83.0.4254.27 / Windows
IP Address:	63.239.33.129
Unique ID:	927661947
Location:	

Name	Robert Brawdera
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Best Practices
Subject:	Best practices must center around natural mosquito population management, not pesticides and chemicals!

Comments:

Rachel Carlson sat in front of Congress in 1963, and gave a statement to the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, on the subject of environmental hazards control of pesticides and other chemical poisons.

Now in 2022, to not hear her message despite evidence accumulating over the many years between then and now to clearly show the effect of upsetting the balance of the environment and introducing toxins which are supposedly safe, would be foolish.

I cannot put it any better than she did.

We only need to look to our neighbors to the north in ME as they currently struggle with the issues of toxins in their environment to see current examples, yet again, of how humans introduce chemicals and toxins into the environment with far reaching and unpredicted negative effects, as Rachel Carson pointed out tends to be the case when we add things to the environment without full knowledge of the long-term ramifications:

https://gearjunkie.com/news/pfas-in-maine-deer-do-not-eat
https://www.newscentermaine.com/article/tech/science/environment/pfas/more-maine-farms-contaminated-by-pfas-chemicals/97-f0b17c9a-2996-4404-88fe-936cb4835228

...with many more examples if one seeks to look and read readily available.

It would seem that there is little to no scientific evidence supporting the spraying of pesticides for mosquito control. There is ample evidence that this supposed "solution" causes damage far beyond the alternative of opting to not spray at all.

Please, as we move forward, let us no longer spray pesticides or chemicals to control adult mosquitoes. Let us only engage in natural methods that encourage the environment to achieve the balance it needs to take care of itself. Instead of spraying, look for local plants and animals that can control the mosquito population, and create guidelines for towns to achieve a natural balance. This is the only true path forward. Rachel told us this many years ago, we've seen it we know it. We cannot undo all of the damage we've done but we can do better to prevent further damage. And, we must.

Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 1:28 pm
Browser:	Safari 15.2 / OS X
IP Address:	96.230.1.107
Unique ID:	927744682
Location:	

Subcommittee to which your comment pertains	Pesticide Selection
Subject:	Mosquito spraying shows limited benefits and many negatives
Comments:	Please consider the damage done to pollinators and other animals (humans included) that are effected by the poisons that are sprayed in an attempt to control nuisance mosquitoes. It is not a good use of tax payer funds.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 1:53 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	71.233.117.236
Unique ID:	927756931
Location:	

Name	Daphne T Stevens
Subcommittee to which your comment pertains	Best Practices
Subject:	Climate Activist thoughts
Comments:	As a 41 year climate activist, I do not believe in using pesticides or larvacides on mosquitoes which are an an important part of the food chain. I believe the planet is already so fragile, that we have no right to destroy other species no matter how small an area. People need to cover themselves if the want to be out at dawn or dusk.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 2:13 pm
Browser:	Chrome 97.0.4692.99 / Windows
IP Address:	216.193.134.203
Unique ID:	927767167
Location:	

Name	Mary J Metzger
Subcommittee to which your comment pertains	Best Practices
Comments:	I am opposed to the current regimen of mosquito control in MA because it is ineffective, harmful to humans, pollinators, and other invertebrates. It is also an expensive burden for local towns. Mosquito control measures should only be used when the State Dept of Health has scientifically determined a level of disease threat in a local mosquito population. The Dept of Health should be given adequate funding for wetlands testing, not an unfunded mandate thrust on towns. Pesticides kill things that eat mosquitos (like dragonflies.) Spraying only at night to protect honey bees, does nothing to protect important native pollinators, like moths, which fly at night. The mosquitos that do survive spraying are more resistant. Spraying loses its effectiveness after the next rain, or as soon as mosquitos from a neighboring area move in. There are thousands of people in MA who have respiratory conditions that are exasperated by spraying. Asking them to remain inside seems a weak prevention at best. And now we find that some pesticides used in the spraying across our wetlands have contained PFAS. Towns, organic farms, and individuals should have an easy and permanent way to opt out of any nuisance spraying. It's important to remember that these control measures do not really guarantee protection from disease. Only personal protective measures do that. There needs to be more public education on removing sources of mosquito larva in yards, avoiding outside activities at dawn and dusk, and applying repellants.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 2:14 pm
Browser:	Chrome 97.0.4692.99 / Windows
IP Address:	216.193.134.203
Unique ID:	927767309
Location:	

Name	Mary J Metzger
Subcommittee to which your comment pertains	Pesticide Selection
Comments:	I am opposed to the current regimen of mosquito control in MA because it is ineffective, harmful to humans, pollinators, and other invertebrates. It is also an expensive burden for local towns. Mosquito control measures should only be used when the State Dept of Health has scientifically determined a level of disease threat in a local mosquito population. The Dept of Health should be given adequate funding for wetlands testing, not an unfunded mandate thrust on towns. Pesticides kill things that eat mosquitos (like dragonflies.) Spraying only at night to protect honey bees, does nothing to protect important native pollinators, like moths, which fly at night. The mosquitos that do survive spraying are more resistant. Spraying loses its effectiveness after the next rain, or as soon as mosquitos from a neighboring area move in. There are thousands of people in MA who have respiratory conditions that are exasperated by spraying. Asking them to remain inside seems a weak prevention at best. And now we find that some pesticides used in the spraying across our wetlands have contained PFAS. Towns, organic farms, and individuals should have an easy and permanent way to opt out of any nuisance spraying. It's important to remember that these control measures do not really guarantee protection from disease. Only personal protective measures do that. There needs to be more public education on removing sources of mosquito larva in yards, avoiding outside activities at dawn and dusk, and applying repellants.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 2:14 pm
Browser:	Chrome 97.0.4692.99 / Windows
IP Address:	216.193.134.203
Unique ID:	927767407
Location:	

Name	Mary J Metzger
Subcommittee to which your comment pertains	Policy Structure
Comments:	I am opposed to the current regimen of mosquito control in MA because it is ineffective, harmful to humans, pollinators, and other invertebrates. It is also an expensive burden for local towns. Mosquito control measures should only be used when the State Dept of Health has scientifically determined a level of disease threat in a local mosquito population. The Dept of Health should be given adequate funding for wetlands testing, not an unfunded mandate thrust on towns. Pesticides kill things that eat mosquitos (like dragonflies.) Spraying only at night to protect honey bees, does nothing to protect important native pollinators, like moths, which fly at night. The mosquitos that do survive spraying are more resistant. Spraying loses its effectiveness after the next rain, or as soon as mosquitos from a neighboring area move in. There are thousands of people in MA who have respiratory conditions that are exasperated by spraying. Asking them to remain inside seems a weak prevention at best. And now we find that some pesticides used in the spraying across our wetlands have contained PFAS. Towns, organic farms, and individuals should have an easy and permanent way to opt out of any nuisance spraying. It's important to remember that these control measures do not really guarantee protection from disease. Only personal protective measures do that. There needs to be more public education on removing sources of mosquito larva in yards, avoiding outside activities at dawn and dusk, and applying repellants.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 2:14 pm
Browser:	Chrome 97.0.4692.99 / Windows
IP Address:	216.193.134.203
Unique ID:	927767478
Location:	

Name	Mary J Metzger
Subcommittee to which your comment pertains	Local Engagement
Comments:	I am opposed to the current regimen of mosquito control in MA because it is ineffective, harmful to humans, pollinators, and other invertebrates. It is also an expensive burden for local towns. Mosquito control measures should only be used when the State Dept of Health has scientifically determined a level of disease threat in a local mosquito population. The Dept of Health should be given adequate funding for wetlands testing, not an unfunded mandate thrust on towns. Pesticides kill things that eat mosquitos (like dragonflies.) Spraying only at night to protect honey bees, does nothing to protect important native pollinators, like moths, which fly at night. The mosquitos that do survive spraying are more resistant. Spraying loses its effectiveness after the next rain, or as soon as mosquitos from a neighboring area move in. There are thousands of people in MA who have respiratory conditions that are exasperated by spraying. Asking them to remain inside seems a weak prevention at best. And now we find that some pesticides used in the spraying across our wetlands have contained PFAS. Towns, organic farms, and individuals should have an easy and permanent way to opt out of any nuisance spraying. It's important to remember that these control measures do not really guarantee protection from disease. Only personal protective measures do that. There needs to be more public education on removing sources of mosquito larva in yards, avoiding outside activities at dawn and dusk, and applying repellants.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 3:05 pm
Browser:	Safari 15.2 / OS X
IP Address:	71.234.178.27
Unique ID:	927792082
Location:	

Name	John Root
Organization:	Pollinate Amherst
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	Best Practices
Subject:	Mosquito Control
Comments:	To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases. In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities. Business as usual cannot continue. Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which Covid-19 attacks. I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country - residents like myself will be watching closely to ensure this opportunity is not missed.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 7, 2022 7:05 pm
Browser:	Firefox 96.0 / OS X
IP Address:	24.91.31.152
Unique ID:	927886988
Location:	

Name	Susan Lowery
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Local Engagement
Subject:	Opt-out provisions must be maintained to reduce exposure to dangerous chemicals
Comments:	To protect health and the environment, no adulticide should ever be sprayed 'on demand,' based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases. In the event that pesticides are used under a clear public health emergency, it is critical that the 21st Century Mosquito Task Force ensure that local communities and residents of the Commonwealth have full disclosure of all pesticide use - including so-called 'inert' ingredients and potential contaminants like PFAS, advance notice of any planned spraying, and universally available opt-out opportunities. Business as usual cannot continue. Unrestricted spraying of toxic pesticides raises serious health concerns, especially during a pandemic, as the same toxic pesticides sprayed for mosquitoes are known to elevate risk factors to our immune and respiratory systems, which Covid-19 attacks. I urge this Task Force to incorporate these suggestions into the development of a 21st century mosquito policy for Massachusetts residents. Please seek out and consult with experts already enacting many of these measures, such as in Madison, WI; Boulder, CO; and Washington, DC. We have a chance to be a model for states throughout the country - residents like myself will be watching closely to ensure this opportunity is not missed.

PUBLIC COMMENTS RECEIVED

February 11 – March 29, 2022

February 13, 2022

Dear Mosquito Control Task Force,

I'm writing on behalf of my family, friends, and neighbors in Wellfleet Massachusetts, who suffered this past summer because of the mosquito infestation generated in the Herring River Basin area of the Cape Cod National Seashore. Because the Cape Cod Mosquito Control was not given approval by the CCNS early enough to apply larvicide to the mosquito breeding grounds and cut necessary access paths, Wellfleet residents and visitors were under siege for months. Since the saltmarsh mosquitoes travel as far as ten miles, all of Wellfleet and parts of Truro were impacted, not just people who live near the Herring River Basin.

As I wrote to Brian Carlstrom, Superintendent of CCNS, mosquitoes destroyed all the simple joys of the summer of 2021. We couldn't eat dinner on our decks, let the children play outdoors, enjoy our gardens, go berry picking, snooze in the hammock, or take an outdoor shower. In order to do necessary outdoor activities like walk the dog or get mail from our mailbox we had to cover ourselves top to toe, wear netting over our face, and slather ourselves in bug spray. Mosquitoes swarmed into the house when we opened a door. If we took the kids to the beach we dashed out to the car and spent most of the drive there swatting the mosquitoes that followed us into the car. The children were covered with bites and were kept up at night scratching them. It was more than just a case of discomfort or inconvenience: it was a human health concern and a community mental health crisis. Weary from coping with the stresses of covid for so long, people were frayed and depressed by the unrelenting onslaught of mosquitoes.

In a telephone conversation I had with Brian Carlstrom, I learned that the Seashore was reluctant to take any measures to control mosquitoes unless they saw it as a public health issue, and their concept of what that was, was extremely narrow (Eastern equine encephalitis or West Nile Virus). Children covered in mosquito bites didn't count. The problem with this policy is that it's not sound public health practice— mosquito control agencies should be working to prevent a public health crisis, not merely reacting when it's already happened. You don't know if mosquitos are carrying EEE until you have adult mosquitoes, and by the time you do, it's too late to use a larvicide to control their breeding and you're forced to turn to fogging with toxic insecticides. At least one of the insecticides being sprayed by commercial companies, bifenthrin, has been classified by the EPA as "a possible human carcinogen " which certainly makes it a human health concern.

In addition to the impact of a mosquito infestation on the human population, failure to deal with mosquitoes early enough had a devastating effect on the environment. People who are as concerned as I am about our fragile Cape

ecosystem resorted to spraying insecticides just so they could carry on their lives. I learned that one of the mosquito management businesses in Wellfleet was spraying a hundred properties a day—and they were just one of the commercial companies. People unable to afford costly spraying "plans" resorted to doing it themselves, spraying pesticides they obtained online. Toxic chemicals contaminated our ground water and killed not just mosquitoes but a broad spectrum of insects, including our most beneficial ones, with repercussions all along the food chain.

We hope that the Mosquito Control Task Force will come up with a plan to control mosquitoes in Massachusetts and another devastating infestation. Thank you for your consideration.

Sincerely,

Corinne Demas
writer@corinedemas.com

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 11, 2022 12:23 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	108.49.66.162
Unique ID:	929483344
Location:	

Name	Danielle Perry
Organization:	Mass Audubon
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	Best Practices
Subject:	Implementing Ecological Restoration Techniques for Mosquito Control
Comments:	• Mass Audubon is collaborating with Bristol County Mosquito Control on a salt marsh restoration project at Allens Ponds Wildlife Sanctuary in Dartmouth, MA that will restore degraded salt marsh habitat as well as remove mosquito breeding habitat. • We are using a method called "runnels," which are shallow channels created to drain water impoundments (pools of water that continuously rest on the marsh surface) that have formed due to sea level rise impacts and are ideal mosquito breeding habitat. • These runnels will remove standing water on the marsh (mosquito habitat) as well as promote vegetation growth to help prevent the form of new water impoundments that serve as mosquito breeding habitat. • Mass Audubon is also supporting another technique called ditch remediation at locations on the North Shore and Cape Cod to fill ditches, with natural salt marsh plant material, that have also led to standing water on the marsh promoting mosquito breeding habitat. • Ditch remediation and runnels will remove standing water on the marsh and prevent the formation of future water impoundments thus eliminating mosquito breeding habitat. • Due to sea level rise and human influence, marshes are more susceptible to degradation leading to the expansion of mosquito breeding habitat. These ecological restoration techniques are low-tech and low risk with minimal environmental consequences and effectively remove mosquito breeding habitat. • Mass Audubon encourages that the Mosquito Control Task Force support these techniques and encourage their utilization for mosquito control purpose in place of spraying.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 11, 2022 12:24 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	108.49.66.162
Unique ID:	929483845
Location:	

Name	Danielle Perry
Organization:	Mass Audubon
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	Policy Structure
Subject:	Implementing Ecological Restoration for Mosquito Control Purposes
Comments:	• Mass Audubon is collaborating with Bristol County Mosquito Control on a salt marsh restoration project at Allens Ponds Wildlife Sanctuary in Dartmouth, MA that will restore degraded salt marsh habitat as well as remove mosquito breeding habitat. • We are using a method called "runnels," which are shallow channels created to drain water impoundments (pools of water that continuously rest on the marsh surface) that have formed due to sea level rise impacts and are ideal mosquito breeding habitat. • These runnels will remove standing water on the marsh (mosquito habitat) as well as promote vegetation growth to help prevent the form of new water impoundments that serve as mosquito breeding habitat. • Mass Audubon is also supporting another technique called ditch remediation at locations on the North Shore and Cape Cod to fill ditches, with natural salt marsh plant material, that have also led to standing water on the marsh promoting mosquito breeding habitat. • Ditch remediation and runnels will remove standing water on the marsh and prevent the formation of future water impoundments thus eliminating mosquito breeding habitat. • Due to sea level rise and human influence, marshes are more susceptible to degradation leading to the expansion of mosquito breeding habitat. These ecological restoration techniques are low-tech and low risk with minimal environmental consequences and effectively remove mosquito breeding habitat. • Mass Audubon encourages that the Mosquito Control Task Force support these techniques and encourage their utilization for mosquito control purposes in place of spraying.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 11, 2022 5:06 pm
Browser:	Chrome Mobile 96.0.4664.110 / Android
IP Address:	172.56.22.133
Unique ID:	929597193
Location:	

Subcommittee to which your comment pertains	Local Engagement
Subject:	Anvil 10 10 and other known toxic chems
Comments:	Do not spray these and kill the earth and disrupt more.life than u save.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 12, 2022 10:39 am
Browser:	Safari 13.1.2 / OS X
IP Address:	96.237.110.167
Unique ID:	929784496
Location:	

Name	Karen Falat
Organization:	Nahant Swim
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Pesticide Selection
Subject:	pesticides
Comments:	There is too much poison in our environment: air, water, food chain. Please reduce damaging sprays; use recommended best practices.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 12, 2022 1:12 pm
Browser:	Safari 15.2 / OS X
IP Address:	71.192.4.176
Unique ID:	929816203
Location:	

Name	Nancy Rea
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Policy Structure
Subject:	Support of bills S 556 and H 937
Comments:	MA should strictly limit use of pesticides for mosquito control, never to be used for nuisance, and ban arial spraying altogether. Prioritize ecologically-based methods, with measurable thresholds, to protect public health and the environment. Thank you for the very informative legislative briefing on 1/26 and the listening session on 2/10. The briefing particularly confirmed my long suspected thoughts and observations of MA current practices. I support bills S 556 and H 937 and hope that the work going forward will make us all safer. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 12, 2022 3:18 pm
Browser:	Safari 15.2 / OS X
IP Address:	71.192.4.176
Unique ID:	929839797
Location:	

Name	Campbell Rea
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Support of bills S 556 and H 937
Comments:	I support these bills efforts to limit use of pesticides and prioritize ecologically-based methods of mosquito control. I advocate banning aerial spraying and all applications for nuisance control. Personal responsibility - screens, clothing and insect repellants - are the way to handle nuisance insects. No need to destroy the environment so that someone can play golf or sit outside without putting on insect repellant.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 10:06 am
Browser:	Firefox 97.0 / OS X
IP Address:	162.245.140.116
Unique ID:	929982041
Location:	

Name	Barbara Darthenay
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	airial and ground pesticide spraying
Comments:	Please allow towns and individual landowners to opt out of spraying for mosquitoes

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 2:56 pm
Browser:	Safari 15.2 / OS X
IP Address:	71.184.193.195
Unique ID:	930039147
Location:	

Name	Sarah Jordan
Organization:	none
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Mosquito control by pesticide
Comments:	Pesticides kill all insects - including the insects that prey upon mosquitoes. There is no pesticide capable of targeting individual "pests". Insect populations as a whole worldwide have decreased by 75 - 90% over recent decades, mainly through habitat loss and pesticide use. Most insects are either neutral to humans or beneficial. Perhaps instead of increasing our dependence on chemicals we should instead look at re-creating healthy wetlands and encouraging beneficial insects, and educating humans about ecosystems.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 5:31 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	72.79.235.115
Unique ID:	930069062
Location:	

Name	Stephanie Gelfan
Subcommittee to which your comment pertains	Pesticide Selection
Subject:	mosquito control spraying
Comments:	Spraying pesticides to kill mosquitos will not only do unknown harm to all sorts of "non targeted" species," but it will definitely harm those species that prey on Mosquitos, such as bats and various birds, not to mention the harm done to all the pollinator species...and our children. Anvil 10+10 is particularly toxic and not just long-lasting, but close to "forever lasting." Add to that the switching of laws and regulations so that towns have to jump through hoops to "opt out," ie, not be sprayed, as opposed to having to opt in, and we have an insane situation. Will we never learn? Especially in this time of bee colony collapse? especially after the famous stories about how out west they poisoned the prairie dogs, only to find that the poisons were then killing all the eagles and other birds who preyed on the prairie dogs. There are much simpler, easier, and SAFER methods of mosquito control, such as those done in Madison Wisconsin, Boulder, Colorado, and even Washington D.C. Please make wise choices: minimal spraying of pesticides, especially Anvil 10+10 and other adult-kill pesticides, and go with mosquito control measures that are safe for the environment and safe for other living species, including humans.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 5:42 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	47.14.78.189
Unique ID:	930070931
Location:	

Name	Claire Golding
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Comments for the Task Force on their draft recommendations
Comments:	As a member of my local environmental committee, I'd like to commend the Task Force for the following ideas related to mosquito control: 1. Reducing costs to municipalities for mosquito control programs by providing a menu option of services. 2. Standardizing staffing of MC Districts, by, for example, employing an entomologist to identify mosquitoes, and a wetland biologist/permit specialist to evaluate/oversee habitat modification efforts. 3. Creation/sharing of public education materials and making them consistent, rather than having every town create their own. 4. Addressing endangered species or environments that attract them in relation to pesticide applications. 5. Making sure there are no PFAS or other harmful substances in materials used to control mosquito populations. 6. A reporting system to keep track of private spraying for mosquitoes, with the aim of understanding and potentially limiting its use. These are very important suggested improvements to the current fragmented and expensive programs in place across the state. I hope legislators will incorporate them into any upcoming legislation.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 6:55 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	162.245.142.12
Unique ID:	930082661
Location:	

Name	Patricia Duffy
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Local Engagement
Subject:	Keep opt out, provide messaging and information.
Comments:	I think the opt-out process is actually good for communities because it will keep them aware of the issue of mosquito disease vectors and the need for towns to create alternatives to spraying. An 'opt-in' would allow for towns to forget about the issue as the disease presence ebbs and flows. The State should have a sound set of recommendations for towns opting out. This would include resources for public outreach (well produced youtube videos for towns to post on their websites, that will appeal to different age groups, including children), and information on mosquito control districts; how they work, what they cost, and so on. Emphasizing personal responsibility (emptying containers that hold water) can empower communities to feel they can keep more pesticides from being sprayed. (Again this message can be easily adapted to high production value youtube videos for towns to post). It's important to have timely messaging from the State to the towns as well. If there is an alert, messages should go out to the towns. If there is a lot of rainfall, a reminder should be sent out. Not every town administrator or council member is aware of the natural cycles of mosquitoes.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 9:39 pm
Browser:	Chrome Mobile 88.0.4324.181 / Android
IP Address:	108.20.55.12
Unique ID:	930109637
Location:	

Name	Claudia Starkey
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Comments:	There are municipalities that have stopped these practices succesfully, see Marlbourough MA for ex, for several years. We need to protect our children from the harmful effects of these carcinogenic substances. Blanket application, biocides is also very harmful to the environment and local ecosystems. Massachusetts local government can do better than knowingly soak our state in cancer causing chemicals in 2022! There are safe products that can be used if necessary that are not toxic.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 13, 2022 10:31 pm
Browser:	Firefox 97.0 / Windows
IP Address:	24.34.194.77
Unique ID:	930118352

Name	Corinne Demas
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Environmental impact of Mosquito infestation on Cape Cod
Comments:	please see uploaded letter
File	https://massgov.formstack.com/admin/download/file/12246386806

Public Comment to the MA Mosquito Control Task Force 2/14/22:

I am writing to communicate that what I am opposed to is a one size fits all mosquito spray policy. Different parts of the State have different environments, disease incidence levels, and different non-targeted resources and therefore different needs. Perhaps, current arbovirus threat is sufficient to make this an opt-out type of program instead of an out-in program but in that case municipalities and their communities must be given clear and reasonable hoops to jump through in order to obtain opt-out status. Public education, on this topic, needs to be much improved and notice to municipal governments improvement also and needs sufficient time to allow for the establishment of appropriate programs so that excellent community education and local control measures, etc., can be developed in a timely and pro-active manner. Sufficient State guidance needs to be provided as soon as possible to provide municipalities the time to adapt their local programs to the higher standards the State seems inclined to require, so that the places where there is mild or no risk have the opportunity to successfully opt-out and those with higher risk are appropriately addressed. We are a diverse State, with many different geographical areas that have their own ecology in terms of risk level and natural mediating effects. What the State can do for all communities is create adequate funding to design and promote consistency of educational message and fund a surveillance program across the Commonwealth. One that not only determines mosquito numbers and disease carrying incidence but additionally provides before and after measurements of populations and harm to non-targeted species in all areas treated for mosquito pestilence. We need to assess the efficacy and unintended consequences of our control measures as we are living in an age of increasing incidences of critical species decline and increasing asthma and chemical sensitivity in our human populations. I do not want this but should you deem that everyone must join a Mosquito district I want State funded education and surveillance and then municipal payment for an ala carte array of treatment choices. Essentially, I am advocating for an ecologically sustainable approach to management of mosquito populations. This requires that the least toxic chemicals and controls are employed when strictly necessary to protect public health. I am opposed to nuisance spraying with anything but natural controls approved by organic growers.

“Focusing on larvae and not adults by working with municipalities to eliminate stagnant water areas through better storm water and stream flows would provide a major improvement without the health hazards of chemical spraying. “ From League of Women Voters of MA testimony.

I am strongly advocating for no aerial spraying as it has not proven effective enough to warrant the risk of its use. PFAS chemicals found in packaging recently must be kept out of our environment. Chemically sensitive persons, children, elders, asthmatics and other more vulnerable individuals must be considered in these decisions and programs designed to protect them.

I am also against truck spraying as both these measures are not targeted enough to be reasonable given the risks adherent in pesticides. We must not harm important birds, pollinators, lobsters, eels etc. that are a part of the web of life which is balanced and offers natural controls when allowed to thrive in a wholesome environment.

The chemical industry, like the tobacco industry and fossil fuel industry, have shareholder concerns as large parts of their decision-making. I am a retired nurse, familiar with the concepts of risks and benefits and the medical creed of first do not harm. Now, nearly 72, I have avoided chemical harms throughout my life. I am not a purest, I like a glass of wine, chocolate and occasionally eat things like bacon but I have gardened organically in a Greenbelt community garden for 20 years, I've avoided aerosols, Teflon and aluminum cookware, too much sun exposure and quit smoking many years ago to do what I could to live

a longer healthier lifestyle. Others, don't perceive risk among the items I listed above, any more that they perceive it in the pouring of chemicals and plastics and carbon dioxide into our precious world. We seem to have grave differences, polarized politics and an absence of agreed upon truth today.

As a citizen, I want a reasonable amount of choice in what I am exposed to. I want my municipality to retain control of mosquito control methods until this problem is great enough to warrant State control. In Gloucester, we are not at that point currently. I understand that with a warming planet that disease vectors will most likely become more of a problem and must be taken seriously, so I appreciate the need for updating Massachusetts policy to effectively respond to todays and tomorrows risks. However, I hope you will choose protecting our gardens, water resources, bees, wetlands, farms, yards, aquatic life and humans from chemical overuse. I am not convinced that the benefits of current chemical use outweighs the risks in many cases and we will not know the full extent of the ill effects of our efforts until later. Be judicious. Be naturalists. Be good stewards of our beautiful and abundant environments. Be discerning. Be transparent. Be uncompromised. Be clear, fair and nuanced in your policies and first do not harm.

Sincerely and hastily written,
Marcia F. Hart RN

The City of Cambridge is a member of the East Middlesex Mosquito Control Project (EMMCP). Cambridge has received excellent services from EMMCP in treating City catch basins and wetlands with larvicide to prevent Mosquito borne diseases such as West Nile Virus. EMMCP has been very knowledgeable and sensitive to the needs of Cambridge and its diverse landscape, with densely developed areas intermixed with parks, rivers, wetlands and a large water supply reservoir. Cambridge wishes to continue and retain its relationship with EMMCP.

Cambridge Department of Public Works (DPW) officials have reviewed the draft policy recommendations to repeal and replace or revise MGL C.252 and enabling MCD/MCP legislations and have concerns with the following recommendation:

> **Amend the Massachusetts Stormwater Handbook (and relevant local land use and stormwater regulations)**
>
> **Recommendation**
> Amend the Massachusetts Stormwater Handbook (and relevant local land use and stormwater regulations) to ensure that newly created stormwater retention and detention basins, including but not limited to, catch basins, sediment forebays, vegetated filter strips, and bioretention swales:
> - Drain or otherwise percolate to a state of no standing water within three days so as not to provide habitat for the development and emergence of mosquitoes
> - Use low-impact development techniques that are designed to require minimal maintenance
> - Be maintained with sufficient frequency to preclude these features to not produce mosquitoes
> - Be listed with the regional MCD and municipal BOH so that the structures may be monitored and treated, as appropriate.

Cambridge has a sewer system that is partially combined (both sewer and storm water in the same pipe) and partially separated, sewer in one pipe and storm water in another pipe. During heavy rain events the combined sewer areas currently discharge wastewater through combined sewer overflows (CSOs) to the Alewife Brook and Charles River. Under State and Federal requirements, Cambridge has been actively working toward reducing the number and volume of CSO discharges which includes separating the combined sewer areas. Sewer separation includes the installation of a combination of new sewer or storm water pipes and manholes, new outfalls and various stormwater best management systems and structures. The improvements include deep sump catch basins, swales, forebays, bio-basins, detention basins, dry wells, infiltrating catch basins and constructed wetlands. While many of these structures are designed to infiltrate stormwater, others are designed to hold water due to high ground water and poor soil conditions. In areas that continue to be combined sewer systems sumps in non-infiltrating catch basins that are designed to hold water are necessary to prevent sewer odors from escaping from the combined sewer system and to contain potentially contaminated water from infiltrating to the ground. In separated areas where infiltration systems are not suitable deep sump catch basins and other structures like forebays are designed to retain stormwater to allow solids or contaminates to settle out and prevent them from discharging to the receiving waters.

Designing or installing stormwater structures to *percolate to a state of no standing water* is not always practical or beneficial given the other design goals and requirements municipalities face to reduce the discharge of pollutants to receiving waters and for proper maintenance of combined sewer areas. We recommend that you amend the recommendation to read as follows (emphasis added):

> Amend the Massachusetts Stormwater Handbook (and relevant local land use and stormwater regulations) to ensure that newly created stormwater retention and detention basins *that are designed to infiltrate*, including but not limited to, catch basins, sediment forebays, vegetated filter strips, and bioretention swales:

Massachusetts Mosquito Control Task Force
Listening Session II on 02.10.2022

Comments from Karen Krusell
16 Country Lane, Belchertown, MA 01007

Thank you for the opportunity to submit written comments to the Mosquito Control Task Force as per your Public Listening Session II on February 10, 2022.

I am a retiree with a background in higher education and environmental health. Please accept the following comments on selected subcommittee's draft recommendations with my appreciation for the time and energy you've each invested in this project.

Create a new Integrated Pest Management Board to coordinate and support state of the art strategies to **mitigate** arbovirus while protecting and preserving natural and built environments and their respective inhabitants (including humans and the spaces in which we live, work, learn, and play).

Consult independent, unbiased, bona fide scientific experts in areas of vital concern not currently represented on the Task Force, e.g. the impact of pesticides on human health and indoor air quality. (Note: Massachusetts' aging housing stock is nearly double the age of Florida's, which likely means they have a significantly higher number of cracks in structural envelopes, many of which are invisible.)

Lead the way on public messaging and education. Empower the public with tools to take personal responsibility (e.g. attire, scheduling, gardens that attract natural predators, fans, etc.).

Prioritize biological and mechanical controls. Clearly identify how the Board defines IPM

Change the culture on adulticiding where still employed. Adulticiding is a tool of last resort with many unintended consequences, not a magic pill.

Protect vulnerable individuals and resources by honoring opt out requests for truck based and aerial spraying from: beekeepers, food growers (from home based to commercial); individuals who are chronically ill and/or disabled by chronic conditions; organic growers (whether home based, transitional, or certified); wildlife refuges and rehabilitation centers, and include a buffer zone around each.

Preserve people with disabilities' rights to obtain reasonable accommodations under applicable state and federal statutes, when medically necessary.

Establish baseline standards and a centralized, public facing, online tracking for surveillance, larvaciding, testing, arbovirus cases and deaths throughout the Commonwealth.

Advise and support Local Boards who likely know their geographic region and people best. Inspire them by publishing centralized tracking of their novel strategies and efficacy data online.

Continue or reinstate each community's ability to opt out of joining local boards and provide transparent, achievable deadlines to do so. If you embrace the recommendations above, you may find more communities willing to join and become productive partners.

Barnstable County
Regional Government of Cape Cod
3195 Main Street | Barnstable, Massachusetts 02630 (508)-375-6618

Department of Health and Environment

SEAN O'BRIEN
Director

ERIKA WOODS
Deputy Director

February 14, 2022

Mosquito Control for the Twenty-First Century Task Force (MC21CTF)
Beth Card, Undersecretary of Environmental Policy and Climate Resilience
Executive Office of Energy and Environmental Affairs
100 Cambridge St.
Suite 900
Boston, MA02114

RE: Mosquito Control for the 21st Century Task Force

Dear Undersecretary Card:

Please let this letter serve as written appreciation and support to the Cape Cod Mosquito Control Project (CCMCP) for all the support given to the Barnstable County Department of Health and Environment and the Cape and Islands Health Agents Coalition regarding mosquito borne diseases that impact our region.

We greatly appreciate CCMCP's proactive stance on scheduling meetings through our Health Agent's Coalition for educating local boards of health about Eastern Equine Encephalitis and West Nile Virus as soon as the first mosquito tests positive in the commonwealth. This partnership we have has proven to be an invaluable resource for ensuring a strong public health response to our region.

Please feel free to contact me should you like to further discuss this the support we receive from CCMCP.

Respectfully,

Sean M. O'Brien

Sean M. O'Brien
Director

OFFICE OF THE
BOARD OF HEALTH
13 AYER ROAD, HARVARD, MA 01451
978-456-4100, ext. 328
boh@harvard-ma.gov

February 14, 2022

Draft comments for hearing on EEA's opt-out process

In May of 2021, the Town of Harvard submitted an application to the State Executive Office of Energy and Environmental Affairs (EEA) to "Opt-Out" of aerial spraying for mosquitoes. The decision criteria used by EEA to accept or reject opt-out applications was not transparent. Additionally, there were several issues with the entire application process, as listed below.

1. EEA did not provide clear definitions of the rules, requirements and expectations in both the application process and which mosquito control activities meet which goals of the State's mosquito control goals.
2. EEA should make protection of natural resources a priority and consider the impact of EEE spraying in fragile environments and in areas which are habitats of endangered animals.
3. EEA should include in a town's score the work the Town does with education and outreach.
4. EEA should provide clear feedback, including a scoring system, so Towns can easily understand how EEA reached their decision and what steps a Town can do to strengthen their response.
5. The application was complex, required much detail on items such as types of equipment and number of hours municipal employees spend on mosquito control activities. An intense effort by volunteer Board of Health members was required to complete the application. (In addition to answering all the EEA questions, we submitted an analysis of land uses in Harvard using Geographic Information System data. The purpose of this analysis was to show that the substantial percentage of tree canopy will greatly limit the effectiveness of aerial spraying to reach the ground.)
6. EEA and the State should make the entire process transparent. The Harvard Select Board wrote to EEA asking for a statement on the reasoning behind the denial. When the response came, from Secretary Theoharides, it indicated that Harvard was denied with the following rationale:

> "EEA assessed the impact of your municipality's alternative plan on regional mosquito control should your request to opt-out be approved, with consideration for historical arbovirus risk and with consideration for strength of plan submission. The impact of your plan as compared to mosquito control conducted by the SRMCB is rated as *moderate regional risk*. As a result, in accordance with M.G.L. c. 252, Section 2A(b)(2), EEA has made a determination **not to approve** your plan for 2021 and the SRMCB will be notified that your plan was not approved."
>
> EEA never indicated that opt-out applications would be denied based solely on their previous rating of risk, which was any town with "moderate risk" would be denied regardless of the technical competence of their application. This determination could clearly have been made without the opt-out application.

Harvard's application to opt-out of aerial spraying was denied by EEA. Pepperell's application, which was a modification of Harvard's application, was approved. We believe that our application was denied because we were rated at moderate risk and without regards to the thoroughness of our opt-out application. Mass Audubon's Director of Policy and Advocacy told Harvard that we had one of the strongest applications she read.

Although Harvard residents are concerned about the threat of EEE, they are also concerned about the aerial dissemination of chemicals that are highly toxic to bees, fish, and many other beneficial species, and which also poses health risks to people. It appears that the state will spray your town regardless of the town's decision over the years not to use pesticides.

In the future, Harvard Board of Health strongly recommends EEA:

1. Document the entire application process before the application period begins.
2. Establish minimum standards detailing who is eligible to apply.
3. Publish evaluation criteria as part of the opt-out application and report a town's score for each of these criteria in the decision.

Sharon McCarthy, Chris Mitchell, Libby Levison
Harvard Board of Health

SAVE THE BAY®
NARRAGANSETT BAY

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SAVEBAY.ORG

February 14, 2022

Massachusetts Mosquito Control Task Force

Dear Members of the Task Force,

Save The Bay, a non-profit environmental organization who mission is to restore habitat and water quality in the Narragansett Bay and Mount Hope Bay watersheds, appreciates the opportunity to provide comments to the Massachusetts Mosquito Control Task Force. Save The Bay has been collaborating with Bristol County Mosquito Control Project since 2016 on salt marsh restoration projects by restoring tidal hydrology caused by legacy agricultural impacts such as embankments and ditches through the installation of shallow runnels. These salt marsh restoration projects reduce impounded water on the marsh platform that creates mosquito breeding habitat. By restoring tidal hydrology, the shallow impounded water areas drain and revegetate, reducing mosquito breeding habitat.

The first project that we conducted with Bristol County Mosquito Control Project was in Dighton, MA in coordination with the Town of Dighton and the Dighton Conservation Commission in 2017. This partnership between Bristol County Mosquito Control Project, Save The Bay and the Town of Dighton has been emulated multiple times at additional salt marsh restoration projects in Dartmouth and Fairhaven in coordination with the Dartmouth Land Conservation Trust, the Buzzards Bay Coalition, the Woodwell Climate Research Center, the Town of Fairhaven and the Fairhaven Acushnet Land Preservation Trust. We are collaborating with Bristol County Mosquito Control's wetland biologist and Massachusetts Audubon Society on another restoration project in Dartmouth that includes restoring the salt marsh and enhancing the marsh migration corridor. All of these projects have the dual goal of restoring salt marsh health and function while reducing mosquito breeding habitat.

Bristol County Mosquito Control Project has taken the lead in these projects by being the project applicant which has helped expedite these projects. Mosquito Control Project staff work collaboratively with restoration partners on the development of the restoration plan and the permit narrative. For some of the projects the partners have been conducting additional pre and post restoration monitoring of additional parameters including vegetation response and effects on water level. During the implementation phase, the restoration partners work alongside the Bristol County Mosquito Control staff who operate the low ground pressure excavator. The restoration partners help with hand digging in areas not suitable for the excavator due to the level of marsh degradation and creation of the structured microtopography using the excavated peat.

This mosquito control and restoration technique has been shared with Plymouth and Cape Cod Mosquito Control Project through site visits and conferences coordinated by the Buzzards Bay Coalition and the Bristol County Mosquito Control Project. These low tech, easily implementable and effective mosquito control techniques are an effective way to control mosquito breeding populations while restoring and enhancing salt marsh habitat.

Save The Bay recommends that the Massachusetts Mosquito Control Task Force include this restoration practice as one of its Best Management Practices and work with Mosquito Control Districts in coastal communities to share this technique through trainings and workshops in coordination with restoration partners from NGOs, natural resource agencies at the state and federal level and research institutions.

Sincerely,

Wenley Ferguson
Director of Restoration

Mosquito Control for the Twenty-First Century Task Force
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Members of the Mosquito Control for the Twenty-First Century Task Force:

I appreciate the chance to provide comment regarding some of the recommendations deriving from Mosquito Control for the Twenty First Century Task Force (MCTF).

First, I would like to note that I serve the Town of Dartmouth, a municipality within Bristol County Massachusetts that is served by the Bristol County Mosquito Control Project (BCMCP). The Town of Dartmouth has worked closely with BCMCP on a wide range of services across the town. It shall be noted that Dartmouth is the municipality with the largest land area in Bristol County, and one of the largest land areas in the state. With such a large municipality along the coast, the residents of Dartmouth receive a wide range of services from BCMCP including public outreach, surveillance, water management, and control of adult mosquito and larva.

The aforementioned actions of BCMCP are noteworthy here in Dartmouth as we live in a part of Massachusetts where both Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV) are endemic. The occurrences of these diseases here in Southeastern Massachusetts is not without consequence to health and our daily lives. Deaths have occurred in Massachusetts from EEE and WNV, and when detection of the mosquitos with the virus increase risk, our community has strongly advised risk reduction measures such as ending outdoor activities at sunset.

efforts when mosquitos are most active.

The Massachusetts Department of Agricultural Resources (MDAR) is the state agency that is required to license pesticide applicators and make standards to protect the public health and environment. Consequently, MDAR has promulgated 333 CMR 2.0 – 14.00 to provide standards for pesticides throughout Massachusetts. The creation of standards by MDAR in 333 CMR 2.00 – 14.00, requires the Department to enforce the regulations. Based on my experience MDAR is not equipped nor desires to enforce their standards in the 333 CMR codes. Thus, the MCTF must recognize this deficiency and not rely upon it to safeguard against unintended consequences from elimination of adulticiding or the rare instance of aerial application to high risk areas for EEE.

Interestingly, we know that the MCTF is forming one size fits all recommendations for Massachusetts, a state with significant variations in mosquito habitat and human population density. We know that Bristol and Plymouth counties are the top two counties for the most mosquito habitat in Massachusetts. Furthermore, the habitat in these counties in Southeastern Massachusetts favors mosquito species that carry EEE. That being said, a one size fits all and banning certain mosquito control practices like occasional aerial applications during a health emergency and ULV for adulticiding may work in some counties, however, this is not well suited for Bristol and Plymouth counties with expansive wetland areas. Furthermore, these two rural counties south of Boston have been growing in population and should be expected to increase in population in the decades ahead and increase the proximity of people to the large wetland expanses.

BCMCP is a publicly funded service of the state with funding derived from local aid. The services that BCMCP administers in each community is provided through government employees. As such with any aspect of government, transparency must occur. Therefore, a comprehensive review

Town of Dartmouth

cc: Representative Christopher Markey

NASHUA RIVER WATERSHED ASSOCIATION

Protecting our water, our land, our communities

February 14, 2022

Mosquito Control Task Force
On-line submittal

Dear Task Force Members,

The Nashua River Watershed Association (NRWA) is a regional advocate for clean water and natural resource protection for 25 communities in north central Massachusetts. We commend the work done to date by members of the MCTF to revise mosquito control practices in Massachusetts to reflect 21st century scientific knowledge and approaches. We submit the following comments on the recommendations.

The state is large and diverse in its natural resources, and does not support a one-size-fits-all approach to mosquito control. Robust community surveillance and monitoring across the state is important for data gathering. Such data gathering should support a more controlled, public health emergency-guided approach that has a menu of options. Spraying should not be used for nuisance mosquito control. Funding should be made available for such data gathering. Communities should be allowed the choice to opt-out, and ANY homeowner, organic farmer (certified or not) should also be given that option, and these options and opt-out data should be made available online.

For those limited situations where pesticide application is found to be necessary, we support a complete review of pesticide formulations, with prioritization of the most ecologically sound options. Many of our communities are struggling with PFAS contamination in their public water supplies, and recent sampling of private wells has shown PFAS contamination from unknown sources.

NRWA is very committed to strengthening biodiversity in our natural resources. The use of pyrethroid insecticides threatens that biodiversity by targeting not only mosquitos, but beneficial pollinators and other wildlife, in addition to human health. We support robust public outreach and education about the risks of pesticide use, both by the state and by commercial mosquito control companies, with a transition to emphasizing non-pesticide forms of mosquito control.

Thank you for allowing this opportunity to comment.

Sincerely,

Martha S. Morgan

Martha S. Morgan
Water Programs Director

592 Main Street, Groton, MA 01450-1230 p 978.448.0299 f 978.448.0941 www.nashuariverwatershed.org

February 14, 2022
Jean A. Lemieux,
Resident of Methuen, MA
Personal written comment by Jean A. Lemieux, a Massachusetts resident under the February 10, 2022 Listening Session for Public Comment before the Task Force on Mosquito Control for the Twenty-First

Best Practices: #13 Protect Vulnerable Populations

My name is Jean Lemieux. I was employed as a school teacher in a suburban community North of Boston from September of 1968 and actively taught senior high school physical education and coached interscholastic athletics for the school system, 23 years, until my total disability in November of 1990. In MACI's written comment I mentioned that I deal with real life experience as both a chemically sensitive individual myself and for the organization. Note that the comments submitted by me as President of MACI apply to my overall personal comment to the Task Force for the 21st Century. However, this personal comment focuses on my very personal experience and I offer it as a former public educator and an injured worker from pesticide exposures on the job.

Establishing a public health policy regarding the application of pesticides and the pesticide residue that remains in the environment for a period of time following application must be recognized. Reforms for the 21st Century protective of the public's health must be adopted by the Task Force and be put forth in the recommendations by the Task Force. This primary focus should not be taken lightly. This is a critical issue for me, the essence of which had and will continue to have a significant impact on my health and my life.

Pesticides, and reducing my exposure to pesticides, is very important in helping to prevent further injury. In the literature pesticides are often cited as one of the major exposures initiating chemical sensitivity illness. Pesticide exposures were among the contributors to my becoming ill and the development of my chemical sensitivity. Pesticide exposures are associated with my triggering of symptoms. And, each of the major pesticide exposure injuries that I had sustained at work worsen my level of multiple chemical sensitivity/chemical intolerance.

I am a face that is attached to a statistic and I went through the stages of illness that I described above. I became disabled from my career as a public school educator. I was denied my right to know about exposure to pesticides in my workplace. When I began my employment with the school district right out of UMASS, I was in excellent health. Over the next twenty years my strong healthy body was subjected to a deteriorating indoor work area of multiple environmental exposures, coupled with a lack of ventilation. I developed a sensitivity to the heavily used disinfectant (a pesticide product) in my locker room and office area and I developed reactive airways disease and a sensitivity to exposure to the pine disinfectant.

Although the physical education/athletic facility had almost annual instances of crawling insects in the locker room, notice about any pesticide use in the area was nonexistent to the teachers, students or the parents. There was only one occasion in my 23 years that I was aware that an indoor pesticide application would take place in the locker room. I want to emphasize it was not because the administrator in charge decided to give me notice, but rather my knowledge about the application was the result of a personal conversation with the custodian that was going to apply the pesticide. No investigation as to the source or type of pest problem was undertaken by the building and grounds supervisor and no effort or attempt was made to notify staff or students in the affected area. However, unknown to me, my office in the locker room was also treated. Three days later after I had experienced acute symptoms from an "exposure" in my office, I found out that my office had received a heavy pesticide application, was sealed up following

it and that it was never ventilated until I walked in and opened the door. This indoor exposure was to a pyrethroid pesticide in early May. Even though I was on a systemic medication for my recently diagnosed asthma and reactive airways disease, on the Monday following the Friday night spray I had an asthma attack followed by profound fatigue. As each school day went on and the work week progressed, I had increasing bouts of difficulty breathing, with frank wheezing, coughing, and fatigue. I didn't begin to improve until the school year ended when I was able to be free of the exposure to the residue from the pesticide application and other exposures that were part of my workplace environment.

As a former physical education teacher and athletic coach I spent considerable time on athletic fields which had been treated, unknown to me, with various pesticides. While the impact of the chronic, long-term and cumulative exposures to various pesticide agents cannot be fully assessed, the impact of an acute work-related outdoor pesticide exposure injury in October 1989 changed my life and it contributed significantly to my deteriorating health, a change in the level of my chemical sensitivity. Now I began to experience reactions and symptoms of multiple chemical sensitivity. I reacted to lower levels of exposure and to more chemicals in my environment. I had acute and chronic symptoms. Despite several attempts of returning to work, I was unable to work for the remainder of that school year. I returned to work the next school season with workplace accommodations which included prior notification to any pesticide application. My employer failed to give me proper notice and I ended up with another pesticide exposure injury on the playing fields that worsened my level of chemical sensitivity/chemical intolerance and resulted in disability from my job and career.

I would like to emphasize that notification to the public about the application of pesticides is a medical necessity for me. My health and my life was drastically changed as a result of pesticide exposures on the job. Now, preservation of my health requires that I avoid exposure to pesticides. It has become a necessity for me as it is for many other vulnerable persons. Reduction in the use of pesticides and proper notification is a necessity. Education of the public about the risks from pesticide exposures needs to be part of the process. Proper messaging is part of the educational and outreach materials.

Opt-out and Exclusions. I urge that the Task Force's Report reflect the public health perspective with regard to the potential risk that pesticides pose to one's health.
1). Include recommendations for policy that is protective of those who are most vulnerable to the inherent risk that pesticide exposures pose on their individual right to protect themselves from serious harm to their health.
2). Honoring a request for exclusions and opt outs from Aerial Spraying and Wide Area Pesticides Application even under a declared state of public health emergency needs your consideration.
#2. Marking methods for property exclusions & property opt-outs be amended to remove physical marking requirement as regulated under 333CMR section 13.03 and make physical markings optional.

Comment about Inerts.
When notified by my city on the last pesticide spraying event that the MCB was undertaking, I tried to get information about the inerts in the product that was going to be sprayed. This is important information that I need to know from my previous exposures to pesticides so I can better judge what my exposure might be. I was unable to get that information from our State's Pesticide Program agency. We need to address this issue and come up with a policy that will provide this information to those who request it.

Thank you for the opportunity to provide public comment in the Listening session regarding this important issue before the Task Force.

Massachusetts Association for the Chemically Injured, Inc.

P.O. Box 754, Andover, MA 01810 Phone: (978) 681-5117
Fax: (978) 686-0745 macimcs@aol.com www.maci-mcs.org

February 14, 2022
Written Comment by the Massachusetts Association for the Chemically Injured under the February 10, 2022 Listening Session for Public Comment before the Task Force on Mosquito Control for the Twenty-First Century

Jean A. Lemieux, President of the Massachusetts Association for the Chemically Injured

On Thursday February 10, 2022 I gave oral comment on behalf of the members of the Massachusetts Association for the Chemically Injured (MACI), a volunteer, non-profit statewide support, education and referral organization for people with Multiple Chemical Sensitivity (MCS). I provided written comments dated May 5, 2021 to the Task Force specific to the health effects that pesticide exposures can have on the chemically sensitive community and the necessity of honoring a request for exclusions and opt outs from Aerial Spraying and Wide Area Pesticides Application even under a declared state of public health emergency. Given the limitations of three minutes imposed on oral comment I said I would follow-up with some additional information and links to references that I feel are pertinent to the Task Force members' understanding of this important issue for the chemically sensitive. I offered some feedback Thursday on the draft recommendations, questions raised and discussion points that is before this Task Force to arrive at reforms for the 21st Century. I will expound on them and offer comment on a few other points. I deal with real life experience, as a chemically sensitive individual myself and in my role in talking with our members and the other contacts made to our organization.

ERG Report: General Comments by Task Force Members. Comments expressed by Heidi Ricci in this section were helpful – they were pointed and gave a clear analysis of some deficiencies. This information is important. The Task Force was given a charge by the legislature and her comments address this and the ERG Report. A few points raised in the comment are the focus for reform should be on protecting human health and the environment, the rights of individuals and communities to avoid undesired exposures to toxic chemicals must be respected, the consultant team was to ensure that the necessary expertise on ecotoxicology and human health effects of pesticides would be included on the consultant team but that did not take place.

Best Practices: #13 Protect Vulnerable Populations

1. Prevalence. In the study by Anne Steinemann, Ph.D, on prevalence published in 2018, it was found that up to 12.8% of the population has a diagnosis of MCS, noting that the prevalence has increased over 300% in the past decade. That figure is up from the 4-6% noted in previous studies. The U.S. Census estimates Massachusetts population July 2021 was roughly 7 million. Conservatively, 5% of 7 million is 350,000, 12.8% is 896,000 Massachusetts' citizens is/would be diagnosed with MCS if MA is consistent with the National study. A larger percentage is noted in the prevalence studies for those who report some level of chemical sensitivity. Dr. Steinemann's full article of "National Prevalence and Effects of Multiple Chemical Sensitivities" (March 2018) is an open access article and can be downloaded from
https://journals.lww.com/joem/Fulltext/2018/03000/National_Prevalence_and_Effects_of_Multiple.17.aspx
Both of these articles have a link from her website as well as the many other papers Dr. Steinemann has published. http://www.drsteinemann.com/publications.html

2. Medical Risk to Pesticide Applications. This group is shown by studies to be at medical risk to pesticide applications.

The quote below was included in MACI's May Comment to this Task Force. I feel it is important to repeat this essential point for the Task Force members in feedback regarding the committee recommendations. In addition to my comment to the Task Force, MACI had included this section in testimony on pesticide bills for the 2019-2020 and 2021-2022 legislative session as it relates to the issue. In addition, MACI also included this

information in our email communication to the Bureau of Infectious Disease and Laboratory Services on January 17, 2020 addressing our concern about information related to persons with chemical sensitivities and asthma contained within MDPH's information release in August 2019 on aerial spraying for mosquitoes that was to take place in Worcester and Middlesex Counties, the website's three page guide about Aerial Mosquito Control to Reduce Risk of Eastern Equine Encephalitis (EEE) Summer (revised 8/19/2019), [https://www.mass.gov/doc/short-fact-sheet-eee-and-mosquito-control-2019/download], and in the FAQs on the MDPH's website.

"Pesticides, and reducing one's exposure to pesticides, are very important issues for our organization. For some of our members, pesticide exposure was a principle contributor to their becoming ill. In the literature pesticides are often cited as one of the major exposures initiating chemical sensitivity illness. Drs. Ashford and Miller noted this point in their Report *Chemical Sensitivity: A Report to the New Jersey State Department of Health* (1989)(1, p.55) and in their book *Chemical Exposures Low Levels and High Stakes* (2. Chapter 1 "Chemical Exposures and Sensitive Populations", p. 5). For an even greater number of chemically sensitive individuals, pesticide exposures are associated with recurrence of symptoms (act as a trigger of symptoms). For some, pesticide exposure has, and can, worsen their level of sensitivity/intolerance. In Chapter 3, "Origins of Multiple Chemical Sensitivity and Effects on Health", Ashford and Miller wrote: "Among the most hazardous exposures for patients seem to be pesticides sprayed outdoors or indoors. Alone, pesticides have accounted for some of the most advanced and persistent cases of chemical sensitivity known to clinical ecologists. As early as 1966, occupational health practitioners observed that certain persons who had recovered from acute organophosphate pesticide poisoning experienced protracted symptoms …" and that "Twenty of 114 individuals stated they could no longer tolerate smelling or contact with pesticides." (2, pp. 62-63). Thus, while important consideration for the public at large, for the chemically sensitive person, prior notification requirements, addressing and the honoring of the pre-existing private opt-out exemptions are critical."

In addition there is a study by Miller and Mitzel (1995) "Chemical sensitivity attributed to pesticide exposure versus remodeling" [Archives of Environmental Health]. A link to the abstract can be found at https://tiltresearch.org/provider-resources/publications/

3. Health Effects. Those with chemical sensitivity, especially those with MCS has specifically been mischaracterized by Marc Nascarella, MA State Toxicologist for the Department of Public Health and minimized by both him and some task force members. When studies, references or questions that came before the members of the task force, even from fellow members, exploring the health effects issue was ignored by some on this task force.

I quoted in our May comment and #2 above a few passages from Ashford and Miller's book, *Chemical Exposures Low Levels and High Stakes*, second Edition. While published in 1998, it still is a go to authoritative and well researched book on the subject. Consider it an excellent reference. Yes, there are published studies and reports since that time and I am providing in this written comment some links to scientific work and reference documents which will be both helpful and creditable for those charged with addressing a public health recommendation perspective for policy. I find it hard to understand a public health agent referencing such a biased set of references in his response to the Task Force questions. I would expect a more balanced selection and response. What was provided by Marc Nascarella as references was a page out of what the "tobacco scientists" (namely the chemical industry) would make reference to. In the article by Bartha, M.D. et al, Multiple Chemical Sensitivity: A 1999 Consensus Statement [May/June 1999 issue of Archives of Environmental Health] the researchers and clinicians involved in the writing of this consensus statement stated: "Given this high prevalence, as well as **the 1994 consensus of the American Lung Association, American Medical Association, U.S. Environmental Protection Agency, and the U. S. Consumer Product Safety Commission that "complaints [of MCS] should not be dismissed as psychogenic, and a thorough workup is essential,"** we recommend that MCS be formally diagnosed – in addition to any other disorders that may be present – in all cases in which the 6 aforementioned consensus criteria are met …." The pdf of the journal article is available from
https://aseq-ehaq.ca/wp-content/uploads/2020/09/1999-MCS-consensus-statement.pdf

Drs. Ashford and Miller's book *Chemical Exposures: Low Levels, High Stakes*, Chapter 8, Key Research Findings since the First Edition, they address the issue of Exposure Challenge Studies. Their review of studies, the flaws, and what is needed to answer important questions in the area of low level chemical exposure has relevance for researchers and scientists who would investigate and attempt to conduct studies on low level exposure to chemical exposure and the resulting symptoms described by individuals expressing chemical sensitivity. On page 218 the authors stated that since the first edition ***"few controlled studies and no adequately designed studies involving provocative challenges have been conducted…"*** (2, p. 218). The authors gave examples of studies that report false negative and false positive results if not properly designed. The authors summarized some of the major flaws: "To date, few exposure studies involving MCS patients have been conducted. Flaws in these studies as described above include: failure to ensure that patients are at baseline (unmasked) prior to challenge; failure to demonstrate that relevant active challenge substances at relevant concentrations are used; failure to demonstrate that masking agents, filter media, and/or other incidental exposures do not provoke symptoms; failure to consider effects of spacing challenges too closely together (causing acclimation or habituation); referral biases affecting the makeup of the study population; and failure to provide essential methodologic details in papers." (2, p. 222).

Regarding psychological symptoms: Drs. Ashford and Miller expound on this issue and they stated:… "Davidoff and Fogarty (1994) pointed out the frequently overlooked fact that psychological symptoms are not necessarily psychogenic: 'According to the consensus within the American Psychiatric Association, psychiatric diagnoses are descriptive entities that subsume signs and symptoms without explaining them. In other words, psychiatric symptoms and diagnoses are "nonspecific" in terms of etiology; these phenomena may have diverse causes.'" (2, p. 255) Ashford and Miller also state "The papers published since the first edition of this book that purport to "prove" psychological causes either simply document psychological symptoms (which are not necessarily psychogenic) in some, but not all, MCS patients (Simon et al. 1990, 1993), make unsupported claims concerning the efficacy of psychological interventions (Staudenmayer et al. 1993b) …or are, for the most part, recycled opinion (Staudenmayer 1996, 1997; Gots 1995;1996)." (2, p.281).

Several physicians' Letters to the Editor were published in the April 15, 1999, American Family Physician in response to the article by Magill and Sundra "Multiple Chemical Sensitivity Syndrome," one of the references listed by Marc Nascarella. I was first introduced to this article through MACI's educational outreach with a Housing Authority's contact regarding educational resources for their "housing" purpose. After investigating this article as a resource MACI recommended a different article that would better address the issues involved. Below I have provided pertinent quotes from portions of 4 such physicians' Letters to the Editor. 1. Dr. Ziem commented about the omission to the joint statement by the American Medical Association, the American Lung Association, the U.S. Environmental Protection Agency and the U.S. Consumer Product Safety Commission (referenced above) and stated that "I am a physician practicing occupational medicine who cares for hundreds of patients with MCS. In my experience, reducing environmental exposure to exacerbating irritants and pollutants consistently results in long-term reduction of symptoms. The effect of reducing exposures has been documented in the medical literature. … Half of the medical literature on MCS has been written in the past five years; hundreds of articles are now available that discuss physiological abnormalities in patients with MCS."
2. Another practicing physician wrote that she strongly disagreed with the authors who had written that avoiding exposures to chemicals does not help patients with MCS. "In my practice, I have repeatedly witnessed the benefits of reducing exposure to chemicals. Symptoms of MCS are not just irritating autonomic disturbances, such as those associated with stage freight, but often are caused by serious reactions such as malignant arrhythmias, asthma, seizures and anaphylaxis. … Encouraging patients with MCS to slowly increase their exposures to chemicals in hopes that the reactions will go away is no more rational or ethical than having patients with diabetes slowly withdraw from insulin and attempt 'to work and socialize despite the symptoms.'"
3. Another physician's letter listed that "MCS is recognized as a potentially disabling condition by the Social Security Administration (1) and the U.S. Department of Housing and Urban Development (2) and it is covered under the Americans with Disability Act (3) on a case-by-case basis, as are all other conditions.
4. Another physician's letter pointed out the "sophisticated disinformation campaign being waged by the chemical industry. This campaign is similar to the campaign used by the tobacco industry to deny the health hazards of its products. In my experience, information that strives to discredit people with MCS and cast doubt on the existence of the illness comes from industry non-profit front groups, industry associations or physicians

who work for the chemical industry, either as expert witnesses or in some other way. In its 1990 Environmental Illness Briefing Paper (2), the Chemical Manufacturers Association (CMA) vowed to work to prevent the recognition of environmental illness (now called MCS) in order to preserve the profits of its member corporations. It also vowed to work with physicians, if necessary, to accomplish this. … The CMA's clearly state goal is to block the recognition of MCS, not to learn the truth about it or to help those who have it."

Additionally, research going as far back as 1998 indicating that toxicology is incomplete in assessing the medical danger of low level chemical exposure was noted in a Viewpoint article by Ashford and Miller: "Low Level Chemical Exposures: A Challenge for Science and Policy". I selected a few pertinent statements: "Once thought to be safe, there is mounting evidence that human exposure to chemicals can be harmful. The exposures are linked with adverse biological effects, including endocrine disruption (1), chemical sensitivity (2), and cancer (3). We are just now beginning to recognize the link between chemicals and new public health problems that challenge the tenets of traditional toxicology and medicine. … Classical approaches and models used in both toxicology and epidemiology, premised on single agents disrupting individual organs, do not explain these diseases."

I find it very disheartening that the excellent work the MCS Advisory Group that was formed under Suzanne Condon had begun in the Education and Outreach Program with the goal of producing educational materials has been ignored in the BEH's response to questions asked. I know for a fact that the BEH had received other creditable educational resources and MACI has continued to do outreach to the DPH's BEH and to the Bureau of Infectious Disease.

Some recommended reference/resources that were given by MACI's President (one of the patient representatives on the MCS Advisory Group) to the MDPH, Bureau Environmental Health since the last meeting of the full MCS Advisory Group included:
1). Ashford, N.A. and Miller, C.S., *Chemical Exposures: Low Levels, High Stakes* referenced above. This book is an expansion of the findings of Ashford and Miller's (1989) work funded by the New Jersey State Department of Health and presented as Chemical Sensitivity before the New Jersey State Department of Health in December. We assume the MDPH has a copy of this book.
2). Miller, C.S., (2003). Chapter 25 Multiple Chemical Intolerance, Doty, R., ed. *Handbook of Olfaction and Gustation, 2nd edition*. New York: Marcel Dekker, Inc.
3). Miller, C.S. and Ashford, N.A. (2000). Multiple Chemical Intolerance and Indoor Air Quality, Spengler, J., Samet, J., McCarthy, J., eds., *Indoor Air Quality Handbook*. New York: McGraw-Hill, Inc.
[Both Chapters at that time could be downloaded from Dr. Claudia Miller's website.]
4). MACI gave BEH a copy of *Amputated Lives* by Alison Johnson and Arnold Mann's book *They're Poisoning Us: From the Gulf War to The Gulf of Mexico.* These books give the picture why this is something worth pursuing by our state's Department of Public Health. This is why we continue to keep the issue on the table with the MDPH. It is an important issue for those already suffering from the illness as well as from a perspective of prevention of illness.
5). A packet of Information on Dr. Claudia Miller's TILT: A New Class of Diseases from her website www.drclaudiamillelr.com.
6). Information about the Environmental Health Clinic, Women's College Hospital, Toronto. They had produced a Report titled Environmental Sensitivities – Multiple Chemical Sensitivities Status Report: Advances in knowledge, and Current Service Gaps.
7). A few other resource papers on MCS.

In MACI's email communication to the Bureau of Infectious Disease and Laboratory Services I attached two documents that I received from Beyond Pesticides. [Beyond Pesticides, a 501(c) 3 nonprofit organization in Washington, D.C., "provides the public with useful information on pesticides and alternatives to their use." (www.beyondpesticides.org)].
1). "An Open Letter By Concerned Physicians and Scientists". While this letter was written in response to West Nile Virus, facts contained within do pertain to the issue of spraying of pesticides: the impact of pesticides on health (p.3) and specifically mentions chemical sensitivity on page 4 and on page 6. Page 5 speaks to Anvil 10+10.

2). A document Public Health Mosquito Management Strategy 2012 pdf. A section on page 10 (PDF page 12) entitled: **Public Officials Must Warn the Public About Virus AND Pesticide Dangers**

"City or town officials have the duty, experience, and resources to warn the public about both mosquito-borne viruses and the dangers of pesticides and should provide information on ways to minimize exposure to both. As discussed on pages 11-14 of this document, pesticides are hazardous to public health and the environment and are even more so for vulnerable populations such as children, the elderly, people with respiratory or compromised immune systems or with chemical sensitivities. Regardless of intentions, government officials should never tell the public that pesticides are safe. EPA prevents manufacturers from making such claims in pesticide advertising and warns, "[N]o pesticide is 100 percent safe and care must be used in the exercise of any pesticide."21 The U.S. General Accounting Office has told Congress on several occasions that the public is misled on pesticide safety by statements characterizing pesticides as "safe" or "harmless."22."

3). MACI referenced Ashford, and Miller's book *Chemical Exposures: Low Levels, High Stakes, second Edition* referenced above and Ashford and Miller's (1989) Report Chemical Sensitivity.

4). Massachusetts Association for the Chemically Injured, Testimony to the Joint Committee on Environment, Natural Resources and Agriculture in support of several pesticide bills

5). New York State Department of Health https://www.health.ny.gov/publications/2738/
Information sheet and pdf form NY Dept of Health 2738 ANVIL NY sheet.pdf

Medical and Research News. MACI's News Update January 2022: To help the Task Force members gain appreciation of individuals who have helped in advancing the understanding of MCS I share the section of my President's Message titled **Reflections** with the Task Force.

Reflections. I have been following the science and research in this area for some 30 years now (a sizeable span of my life). As I reflected back over these years several medical professionals and scientists/researchers and their works came to mind. Of course, Theron Randolph - a clinician and an early pioneer who saw patients and took extensive histories, documenting patients' accounts of symptoms and illness and their relationship to the chemical environment. His approach to taking a history was far more detailed than the average clinician's and his ability to see associations were beyond the customary thought of his era. Next in my thoughts were the scientists/researchers – Dr. Claudia Miller and Dr. Iris Bell - who wrote and presented White Papers [Chemical Sensitivity: History and Phenomenology; Neuropsychiatric Aspects of Sensitivity to Low-Level Chemicals: A Neural Sensitization Model] at the Conference on Low-Level Exposure to Chemicals and Neurobiologic Sensitivity. Drs. Ashford and Miller's Viewpoint article "Low-Level Chemical Exposures: A Challenge for Science and Policy" in which they wrote: "We are just beginning to recognize the link between chemicals and new public health problems that challenge the tenets of traditional toxicology and medicine." And, of course, the expansion on previous research with the development of Dr. Miller's **TILT** Theory of Disease. Dr. Ashford's **thought experiment** "If you throw a Magnet in a Computer …It TILTs" - remarks that he offered before his prepared talk at a 2012 National Academy of Sciences Workshop; remarks to stimulate thinking about the brain, "computer central to our entire existence". I also thought about Dr. Meggs and his early presentation of a "Hypothetical Chemical Stress Syndrome" and his research looking at biopsy studies, "neurogenic inflammation" and "neurogenic switching" and Dr. Martin Pall with his proposed plausible mechanism of Explaining "Unexplained Illnesses". Reading the new paper by Dr. Molot (listed below) brought to mind Dr. Julius Anderson's joint paper with Dr. Pall "The Vanilloid Receptor as a Putative Target of Diverse Chemicals in Multiple Chemical Sensitivity." Drs. Hu and Baines' Commentary "Recent insights into 3 underrecognized conditions" that appeared in the June 2018 Canadian Family Physician could be distributed to clinicians, in particular, primary care practitioners. In Future Steps they wrote: "With respect to ES-MCS, there is a growing body of research being published by investigators in Europe and Japan, which has provided evidence supporting the involvement of neurobiological(17,18), metabolic (19), and genetic susceptibility factors(20). (MACI distributed one copy of this paper for educational purposes to each MACI member) I have only mentioned the few selected examples above but I would add to this listing the physicians and other health professionals who across the country and the many in our backyard of Massachusetts who listen to patients, evaluate their histories and symptoms, offering medical advice and treating their patients with understanding and respect. Unfortunately, a few of these caring physicians left clinical practice in Massachusetts but they have continued to be professionally involved and have served on the Canadian Task Force on Environmental Health (Dr. Hu and

Dr. Oliver) [both were members of the BEH's MCS Advisory Group] that produced a Phase 1 Report and the Final Report of the Ontario Task Force for Environmental Health entitled "**Care Now**: An Action Plan to Improve Care for People with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS), Fibromyalgia (FM) and Environmental Sensitivities/Multiple Chemical Sensitivity (ES/MCS)" (December 2018) released by the Minister for Health and Long Term Care.

4. In MACI's oral comment to the Task Force I mentioned: There are recent studies such as Dr. Miller's from the Hoffman TILT Program, University of Texas Health Science Center at San Antonio and John Molot's, study out of Canada which scientifically correlate chemical/xenobiotic exposure with the start of and exacerbation of Multiple Chemical Sensitivity/Multiple Chemical Intolerance. Below are the links to the three studies I reference above. All are published open access studies. I my January news update message section **Looking forward** I brought to our members attention three recent research studies that have been published addressing mechanisms – two relating basic mechanisms and chemical sensitivity and a discussion paper on the TILT Theory of disease which helps scientists and medical professionals understand and appreciate the two stage step (process) of TILT: first stage of initiation and stage two of triggering (symptoms from triggering exposures).

Research Article: Masri et al. (May 27, 2021). "Toxicant-induced loss of tolerance for chemicals, foods, and drugs: assessing patterns of exposure behind a global phenomenon", Environmental Sciences Europe Pdf. Open Access
https://tiltresearch.org/2021/06/28/new-study-provides-a-link-between-common-chemicals-and-unexplained-chronic-illnesses/?eType=EmailBlastContent&eId=ea75b62c-dd0a-49b2-beb1-92968aff9921
The Hoffman Tilt Research blog post June 28, 2021 stated: The paper "reviews eight events in which groups of individuals shared the same exposure to chemicals and developed multi-system symptoms and new-onset intolerances, either through a single major event or repeated low-level exposures."
On page four the authors state: "By examining these case studies as a whole, and identifying which exposures are most associated with TILT initiation, this analysis provides insights that can aid in TILT intervention, and could help guide patients, physicians, and policymakers as it relates to the future prevention and treatment of TILT."

Research Article: Miller et al. (2021). "Mast cell activation may explain many cases of chemical intolerance" (Environmental Sciences Europe 33:129) Open Access
Link for the open access study: https://link.springer.com/epdf/10.1186/s12302-021-00570-3?sharing_token=y8QsRW69UahXo84J12GdB2_BpE1tBhCbnbw3BuzI2RMvgnPzw0ILkNoaO49kkUNR_TK5MQAg_Gg2TI--gzYpwA6_JVP7dfp_VyeVDQYi1yZ_9qapxOgKY66OWlRZjaCYHHe1xZ3qKSJ8-WeB2lbPdA6lww86vd1miZRz1f_U0P4%3D
The Hoffman Tilt Research blog post December 2, 2021 stated: " 'Advancing our understanding of mast cells offers the potential to predict, prevent and treat many exposure-induced illnesses,' said Claudia Miller, MD, MS, professor emeritus in the department of family and community medicine at UT Health San Antonio, the lead author of the study. 'This understanding opens a new window between medicine and environmental exposures.'"

Research Article: (Canada)
John Molot, Margaret Sears, Lynn Margaret Marshall, Riina I Bray (September 2021).
"Neurological susceptibility to environmental exposures: pathophysiological mechanisms in neurodegeneration and multiple chemical sensitivity." (Rev Environ Health.) Open Access
Link to the article https://www.degruyter.com/document/doi/10.1515/reveh-2021-0043/html
Section from the Abstract: "The World Health Organization lists air pollution as one of the top five risks for developing chronic non-communicable disease, joining tobacco use, harmful use of alcohol, unhealthy diets and physical inactivity. This review focuses on how host defense mechanisms against adverse airborne exposures relate to the probable interacting and overlapping pathophysiological features of neurodegeneration and multiple chemical sensitivity. Significant long-term airborne exposures can contribute to oxidative stress, systemic inflammation, transient receptor subfamily vanilloid 1 (TRPV1) and subfamily ankyrin 1 (TRPA1) upregulation and sensitization, with impacts on olfactory and trigeminal nerve function, and eventual loss of brain mass."

5. Utah Physician for a Healthy Environment. How many of you have looked at the Utah Physicians for a Healthy Environment document that had been raised by a fellow member? American Academy of Pediatrics conference presentation 2016: "New Research suggests that the use of airplanes to spray anti-mosquito pesticides may increase the risk of autism spectrum disorder and developmental delays in children." Toxicologist Linda Birnbaum stated that "existing US regulations have not kept pace with scientific advances showing that widely used chemicals cause serious health problems at levels previously assumed to be Safe."

Local Engagement.
Opt-out and Exclusions: I urge that the Task Force's Report reflect the public health perspective with regard to the potential risk that pesticides pose to one's health.
1).Include recommendations for policy that is protective of those who are most vulnerable to the inherent risk that pesticide exposures pose on their individual right to protect themselves from serious harm to their health.
2). Honoring a request for exclusions and opt outs from Aerial Spraying and Wide Area Pesticides Application even under a declared state of public health emergency needs your consideration.
#2. Marking methods for property exclusions & property opt-outs be amended to remove physical marking requirement as regulated under 333CMR section 13.03 and make physical markings optional.
#3 Public Engagement.
Improve outreach to the public.
Educational and outreach Materials and Messaging. Other points that are of importance to our organization include the educational materials and messaging that are produced and made available to the public. See my comments under MACI's email communication to the Bureau of Infectious Disease and Laboratory Services.

Thank you for the opportunity to provide public comment, both in oral and written, in the Listening session regarding this important issue before the Task Force.

Sincerely,

Jean A. Lemieux

Jean A. Lemieux,
President

References:
1. Ashford, N., and Miller, C., *Chemical Sensitivity: A Report to the New Jersey State Department of Health*, December 1989.
2. Ashford, N. and Miller, C. *Chemical Exposures: Low Levels and High Stakes*, Second Edition (1998), Van Nostrand Reinhold, New York.
3. Ashford and Miller (1998) "Low Level Chemical Exposures: A Challenge for Science and Policy" Environmental Science & Technology/News.
4. Bartha, M.D. et al, (May/June 1999) "Multiple Chemical Sensitivity: A 1999 Consensus Statement" (Archives of Environmental Health]
5. Letters to the Editor (1999) "Understanding Patients with Multiple Chemical Sensitivity", American Family Physician.
6. Masri et al. (May 27, 2021). "Toxicant-induced loss of tolerance for chemicals, foods, and drugs: assessing patterns of exposure behind a global phenomenon", Environmental Sciences Europe Pdf.
7. Miller et al. (2021). "Mast cell activation may explain many cases of chemical intolerance" (Environmental Sciences Europe 33:129).
8. John Molot, Margaret Sears, Lynn Margaret Marshall, Riina I Bray (September 2021). "Neurological susceptibility to environmental exposures: pathophysiological mechanisms in neurodegeneration and multiple chemical sensitivity." (Rev Environ Health.).
9. Anne Steinemann, Ph.D., (March 2018) "National Prevalence and Effects of Multiple Chemical Sensitivities" JOEM. Volume 60, Number 3.

MASSQUITO COALITION COMMENTS TO

MOSQUITO MANAGEMENT FOR THE 21ST CENTURY TASK FORCE

The MassQuito Coalition, a coalition of fifteen state and national NGOs, is concerned the Task Force recommendations hinder the public education and implementation of best management practices for mosquitoes. The Mosquito Control Districts and local communities that want to opt-out of state actions also struggle to comply with current guidelines due to ongoing changes to recommended practices. The MassQuito Coalition encourages the Task Force to be concise in its recommendations with a focus on environmental and public health best management practices that are transparent and based on robust and independent science. Attached you will find the MassQuito Coalitions' concerns and comments pertaining to the specific Task Force recommendations.

Task Force Topic	Task Force Subcommittee Draft Recommendation	MASSQUITO Coalition Comments
Policy Structure	**1. Repeal and replace OR revise MGL C. 252 and enabling MCD/MCP legislations**	**Agree**
	2. Amend the Massachusetts Stormwater Handbook (and relevant local land use and stormwater regulations)	**Agree**
	3. Revise the structure, function, and funding of MCDs to ensure a comprehensive and cohesive framework for mosquito control across Massachusetts and to potentially allow for towns to join MCDs at lower costs	**Agree**
	4. Establish baseline mosquito control services such as education, surveillance, source reduction and allow people/ member towns to add additional services such as larviciding, adulticiding, and local stormwater management	**Disagree with adulticiding. Adulticiding should *only* be used during public health emergencies based on robust, independent, and transparent scientific evidence. Support for "aquatic habitat restoration" should be added.**

GREEN Shading = Agree with Draft Recommendations; **YELLOW Shading = Needs Improvement**; **RED Shading= Disagree with Recommendation**

Task Force Topic	Task Force Subcommittee Draft Recommendation	MASSQUITO Coalition Comments
Best Practices	**1. Improve consistency in the implementation of IPM**	**Agree**
	2. Limit ground-based applications of adulticides	**Eliminate ground-based applications of adulticides except in true public health emergencies, based on robust, independent, and transparent scientific evidence**
	3. Authorize and fund statewide mosquito surveillance	**Agree, and using an improved surveillance program**
	4. Improve consistency in MCD staffing	**We do not understand what is meant here. Local conditions might require different types of staffing. What consistency are you referring to? Consistent numbers of staff or consistent educational backgrounds? Please clarify.**
	5. Establish statewide education on mosquito management.	**Agree; must include education for state pesticide applicators with proper pesticide application procedures. Must include education on personal protection to/by public and deterrent/mosquito reduction practices.**
	6. Prohibit aerial applications of adulticides	**Agree.**
	7. Develop online reporting system for private applicators	**Agree.**
	8. Establish system of communication with public water systems	**Agree.**
	9. Develop statewide QA/QC testing program for mosquito control chemicals	**Agree with QA/QC testing. Not certain what testing is being recommended or testing frequency. Pesticides should be used only as a last resort.**
	10. Protect receptor areas from pesticide run-off	**Unclear – what is a receptor area? We hope to stop using pesticides and pesticides must not be used if they run off.**
	11. Reduce pesticide applications for nuisance control	**ELIMINATE all pesticide applications for nuisance control. Develop reporting & education procedures to deal with nuisance conditions.**

	12. MCDs to conduct monitoring and evaluations after spraying	**Disagree – spraying should be eliminated. Monitoring should also be done after larviciding.**
	13. Determine procedures to protect vulnerable populations and non-target species	**Eliminating spraying will protect vulnerable populations and non-target species. Schedule and details needed.**
	14. Set criteria for declaring a public health emergency	**Agree – must be robust, independent, and transparent.**
	15. Offer current opt-out option to commercial farms	**Expand and clarify definitions – need to include all farms and all crops that might be sold (apiaries, herb gardens, chicken/eggs, other). Opt-out should be offered to all farms whether commercial, organic, community supported gardens, home gardens, etc.**
	16. Codify the current protected status for certified farms	**Unclear. Is this for certified organic farms? See comments above.**

Task Force Topic	Task Force Subcommittee Draft Recommendation	MASSQUITO Coalition Comments
Local Engagement	**1. Create an online system for requesting property exclusions and propertyopt-outs**	**AGREE**
	2. Remove physical marking requirement s for property exclusions and property opt-outs	**AGREE**
	3. Public Engagement: improve outreach to the public and input from the public	**AGREE**
	4. Establish a menu-based approach: funding/resourcesby the state; opt-in to additional services at discretion of municipalities	**AGREE**
	5. Create program for pilot evaluation of environmental impacts.	**AGREE. Yet we need to go beyond a pilot program; we need to start comprehensively evaluating impacts now. Clarify impacts from what? Historic spraying? Future spraying? The MassQuito Coalition recommends eliminating use of pesticides wherever possible.**
	6. Increase sharing of pesticide application locations	**We recommend complete disclosure of what pesticides are being used in Massachusetts for mosquito management, where they are being sprayed and how much volume has been sprayed. This information should be available on a public facing website. The MassQuito Coalition recommends sharing information about the locations of mosquito traps monitoring for disease with the local Boards of Health**
	7. Increase transparency on sensitive habitat/rare species exclusion	**Unclear – what is meant here? Transparency is a good thing, but there should not be spraying on these sensitive habitats/rare species. Pesticide companies should be educated about online sources of information showing the locations of sensitive receptors.**

Task Force Topic	Task Force Subcommittee Draft Recommendation	MASSQUITO Coalition Comments
Pesticide Selection	**1. Further review pesticide products used in mosquito control and ensure transparent selection process**	**Agree with transparency; subcommittee should have NGO or academic, conservation/environmental representatives. Risks need to include total pesticides and toxics burden. Document how to share this information**
	2. Consider synergists: conduct periodic assessments of insecticide levels; evaluate whether synergism of insecticides is already present or possible	**Agree. Detailed Task Force document recommends annual reviews; review must include volumes/amounts as well as names of products used. Include effects on endangered and rare species. How will this information be shared? Recommend online summaries.**
	From Detailed comments - #3. Impacts on Drinking Water (the numbering sequence does not synch up with number of recommendations provided on the screen during the Listening Sessions).	**Groundwater protection list is inadequate because the toxicity threshold is too high, and should be lowered to be protective of drinking water and ecosystems. Following the EPA groundwater rule (40 CFR 152.170) is not protective enough for the pesticide selection process.**
	3. Establish several mechanisms to avoid use of PFAS-containing pesticides	**Agree. Need to use total organic fluorine analyses in addition to the targeted PFAS analyses. The Pesticide Selection process must prevent PFAS compounds in the active ingredients, inert ingredients, or as a contaminant. More detail is needed.**
	4. No recommended action relative to active ingredient disclosure	**Disagree; additional evaluation is needed into the active ingredients, as well as documenting the Confidential Business Information (CBI). The mosquito management program has used pesticides for years and do not know what is in the products used. Case in point is the PFAS contamination found in Anvil 10+10, which was discovered only after PEER collected a sample and had it analyzed for PFAS compounds in 2020.**
	5. No recommended action relative to inert ingredient disclosure	**Disagree; EPA's evaluation of inert ingredients in pesticides is inadequate. Pesticide Sampling should be addressed in the Task Force recommendations. The MassQuito Coalition recommends periodic sampling.**

	6. Update/amend the Massachusetts Pesticide Control Act to address the components of inert ingredient review	**Agree – we believe the Pesticide Control Act should be updated and/or amended to address ALL of the components in the ingredient review. We would like to understand the details of this recommended process. We support the state going beyond the EPA regulations.**

Representing the MassQuito Coalition

Public Employees for Environmental Responsibility
Kyla Bennett, PhD, JD
Director, New England PEER

Massachusetts Association of Conservation Commissions
Dorothy McGlincy, Executive Director

LEAD for Pollinators, Inc.
Michele Colopy, Executive Director

Beyond Pesticides
Drew Toher, Community Resource and Policy Director

Conservation Law Foundation
Saranna Soroka

Testimony to MCTF (Mosquito Control Task Force)

As an elderly resident living in Massachusetts I have medical documentation from the Lahey Clinic that I have been chemically injured by pesticides. I write to inform the Task Force of the very real health risks from pesticide sprayed either by truck or by aerial methods.

Though registered on the MA Agriculture Department's Mosquito Spraying Exclusion List, in reality, this is hardly a panacea. The exclusion list stipulates no spraying within 300 feet of an individual's residence. However, breezes or winds can and do carry the vapors from the sprayed pesticide, and these do penetrate the house (despite closed windows) and have severely sickened me, as well as others who are chemically sensitive. Symptoms which appear immediately upon inhaling the vapors that have penetrated the home include: difficulty breathing, painful, swollen neck lymph nodes, sore throat, and itchy eyes.

Any decision to use aerial spraying would be a disaster for the elderly, children, pregnant women, the asthmatic and those already chemically injured. It would undoubtedly mean having to vacate our homes for possibly days and then returning to a home penetrated by pesticide vapors. Then having to to treat the house to remove the residual harmful substances, a complicated process that I have had to undertake in the past.

We urge the State to do its duty to protect the health of its most vulnerable citizens and all citizens and to reject the use of aerial spraying for the above reasons.

The number of cases of West Nile Virus, EEE, and other mosquito-borne diseases are small in comparison to the known harm that has already been inflicted on vulnerable citizens by truck-mounted pesticide spraying over the years. Escalating this approach to aerial spraying would only compound the damage to public health.

As a recommended remedy to this study deficiency, a MCTF Subcommittee voted against a MCTF member's request for expert testimony on harm to human health by pesticides. Why? Studies such as Dr. Claudia Miller's University of Texas Health Science Center research study showing a connection between pesticides and mast cell disorder and others were all repeatedly and summarily dismissed by the MCTF. Because of this lack of due process, the effects on vulnerable populations (elderly, children, pregnant women, asthmatic and chemically injured) went unaddressed. This needs to be addressed and rectified as soon as possible.

There are numerous other studies documenting harm from pesticides which I would be happy to provide. Thank you.

Respectfully submitted,

Ruth A. Rin

Burlington, MA

Public Comment to the MA Mosquito Control Task Force 2/14/22:

I am writing to communicate that what I am opposed to is a one size fits all mosquito spray policy. Different parts of the State have different environments, disease incidence levels, and different non-targeted resources and therefore different needs. Perhaps, current arbovirus threat is sufficient to make this an opt-out type of program instead of an out-in program but in that case municipalities and their communities must be given clear and reasonable hoops to jump through in order to obtain opt-out status. Public education, on this topic, needs to be much improved and notice to municipal governments improvement also and needs sufficient time to allow for the establishment of appropriate programs so that excellent community education and local control measures, etc., can be developed in a timely and pro-active manner. Sufficient State guidance needs to be provided as soon as possible to provide municipalities the time to adapt their local programs to the higher standards the State seems inclined to require, so that the places where there is mild or no risk have the opportunity to successfully opt-out and those with higher risk are appropriately addressed. We are a diverse State, with many different geographical areas that have their own ecology in terms of risk level and natural mediating effects. What the State can do for all communities is create adequate funding to design and promote consistency of educational message and fund a surveillance program across the Commonwealth. One that not only determines mosquito numbers and disease carrying incidence but additionally provides before and after measurements of populations and harm to non-targeted species in all areas treated for mosquito pestilence. We need to assess the efficacy and unintended consequences of our control measures as we are living in an age of increasing incidences of critical species decline and increasing asthma and chemical sensitivity in our human populations. I do not want this but should you deem that everyone must join a Mosquito district I want State funded education and surveillance and then municipal payment for an ala carte array of treatment choices. Essentially, I am advocating for an ecologically sustainable approach to management of mosquito populations. This requires that the least toxic chemicals and controls are employed when strictly necessary to protect public health. I am opposed to nuisance spraying with anything but natural controls approved by organic growers.

“Focusing on larvae and not adults by working with municipalities to eliminate stagnant water areas through better storm water and stream flows would provide a major improvement without the health hazards of chemical spraying. “ From League of Women Voters of MA testimony.

I am strongly advocating for no aerial spraying as it has not proven effective enough to warrant the risk of its use. PFAS chemicals found in packaging recently must be kept out of our environment. Chemically sensitive persons, children, elders, asthmatics and other more vulnerable individuals must be considered in these decisions and programs designed to protect them.

I am also against truck spraying as both these measures are not targeted enough to be reasonable given the risks adherent in pesticides. We must not harm important birds, pollinators, lobsters, eels etc. that are a part of the web of life which is balanced and offers natural controls when allowed to thrive in a wholesome environment.

The chemical industry, like the tobacco industry and fossil fuel industry, have shareholder concerns as large parts of their decision-making. I am a retired nurse, familiar with the concepts of risks and benefits and the medical creed of first do not harm. Now, nearly 72, I have avoided chemical harms throughout my life. I am not a purest, I like a glass of wine, chocolate and occasionally eat things like bacon but I have gardened organically in a Greenbelt community garden for 20 years, I've avoided aerosols, Teflon and aluminum cookware, too much sun exposure and quit smoking many years ago to do what I could to live

a longer healthier lifestyle. Others, don't perceive risk among the items I listed above, any more that they perceive it in the pouring of chemicals and plastics and carbon dioxide into our precious world. We seem to have grave differences, polarized politics and an absence of agreed upon truth today.

As a citizen, I want a reasonable amount of choice in what I am exposed to. I want my municipality to retain control of mosquito control methods until this problem is great enough to warrant State control. In Gloucester, we are not at that point currently. I understand that with a warming planet that disease vectors will most likely become more of a problem and must be taken seriously, so I appreciate the need for updating Massachusetts policy to effectively respond to todays and tomorrows risks. However, I hope you will choose protecting our gardens, water resources, bees, wetlands, farms, yards, aquatic life and humans from chemical overuse. I am not convinced that the benefits of current chemical use outweighs the risks in many cases and we will not know the full extent of the ill effects of our efforts until later. Be judicious. Be naturalists. Be good stewards of our beautiful and abundant environments. Be discerning. Be transparent. Be uncompromised. Be clear, fair and nuanced in your policies and first do not harm.

Sincerely and hastily written,
Marcia F. Hart RN

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 10:08 am
Browser:	Chrome 97.0.4692.99 / Windows
IP Address:	96.233.151.200
Unique ID:	930265227

Name	Wenley Ferguson
Organization:	Save The Bay
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	Best Practices
Subject:	Tidal hydrology restoration to reduce mosquito breeding habitat
File	https://massgov.formstack.com/admin/download/file/12248447498

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 12:36 pm
Browser:	Chrome Mobile 98.0.4758.85 / iOS
IP Address:	99.150.230.242
Unique ID:	930335880
Location:	

Name	Vi Patek
Organization:	Nahant S.W.I.M. Inc.
Subcommittee to which your comment pertains	Best Practices
Subject:	Spraying pesticides
Comments:	Our organization believes that there is more spraying than warranted given the very small number of people threatened by mosquito borne disease.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 1:28 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	131.109.129.139
Unique ID:	930358535

Name	Sean O'Brien
Organization:	Barnstable County Department of Health and Environment
Subcommittee to which your comment pertains	Local Engagement
File	https://massgov.formstack.com/admin/download/file/12249882695

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 1:36 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	162.245.143.124
Unique ID:	930362204
Location:	

Name	Peggy Wolff
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Pesticide Selection
Comments:	I am writing to strongly oppose aerial spraying of any potentially harmful chemicals, on-going ground spraying of potentially harmful chemicals in residental areas and limiting a town's decision to opt-out of pesticide applications. As a Master's prepared RN who (1) became chemically sensitive in part due to pesticides used on my property and (2) counseled numerous individuals who were chemically poisoned through the use of pesticides, I support the use of non-toxic means to control mosquitos. I want the committee to know that exposure to pesticides can be a sensitizing experience. One's health can be forever changed. It is crucially important to think like Native Americans who ask themselves, "How does some action taken today effect generations to come?" Damage can not be reversed in many circumstances. Thank you, Peggy Wolff, MS, RN Leverett

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 1:50 pm
Browser:	Firefox 97.0 / Windows
IP Address:	216.193.175.218
Unique ID:	930368258
Location:	

Name	Anna Hanchett
Organization:	Plainfield Agricultural Commission
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	eliminating spraying and reducing use of pesticides
Comments:	The Plainfield Agricultural Commission led the effort to opt out of the state 2021 plan to spray the state for mosquitoes. We are very supportive of the work done by the Task Force and the proposed changes to the state plan. It is vital that mitigation methods carefully consider all the effects of the use of pesticides, not only on the diseases carried by mosquitoes which affect humans, which are very limited in Massachusetts, but the far more damaging effects of the pesticides themselves on the whole population. The Task Force introduced awareness of the devastating effects on major parts of the environment which were not considered in the original spray program. This is vital. The spray could severely damage the already declining population of important insects, birds, and animals in our environment by poisoning them. The fact that mosquitoes are a main source of food for many birds, insects such as dragonflies, and small fish and amphibians has not been considered. The presentations given in the first hearing of the Task Force on January 26th were comprehensive and excellent. Ideally mosquitoes should, and can, be controlled by means other than pesticides, especially those being sprayed on adult mosquitoes. And such precautions are far less expensive than an ineffective spray program. Thank you for giving so many opportunities for public comment on the excellent hearings. Plainfield Ag. Comm. and other local leaders of the Opt-out effort

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 2:05 pm
Browser:	Firefox 97.0 / Windows
IP Address:	47.14.4.137
Unique ID:	930375098

Name	Sharon McCarthy
Organization:	Harvard Board of Health
Subcommittee to which your comment pertains	Policy Structure
Subject:	Comments on Opt-Out Application Process
File	https://massgov.formstack.com/admin/download/file/12250144002

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 2:56 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	98.110.183.206
Unique ID:	930396888
Location:	

Name	Linda Scharf
Subcommittee to which your comment pertains	Best Practices
Subject:	Please make decisions based on current and future health of humans and Nature, of which we are a part!
Comments:	Thank you for your efforts to create a 21st century mosquito control program for the state of Massachusetts and for inviting public comment. Application of any mosquito adulticide should be the least toxic product available. The state's current pesticide of choice, Anvil 10+10, is highly toxic and not acceptable, given the availability of minimum risk and organic certified alternatives. Recently published reports in the Boston Globe indicate this product contains undisclosed PFAS "forever chemicals" associated with a range of diseases. The unknowns associated with toxic EPA-registered pesticides underlines the need for an approach that does not place these products at the top of the toolbox. To protect health and the environment, no adulticide should ever be sprayed "on demand" based on nuisance mosquito populations. Likewise, aerial spraying is ineffective, places public health at unnecessary risk, and should not be permitted in a 21st century mosquito program. If science-based measures are followed, personal protective measures can address nuisance mosquitoes, and monitoring, surveillance, habitat manipulation and judicious use of larvicides will effectively protect the public from mosquito-borne diseases. Please do all you can do to keep the public informed about what choices will be made in future. Keep future generations in mind when thinking about mosquito control. Let us do that which causes the least harm and helps to get the Earth back into balance.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 3:00 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	24.63.226.180
Unique ID:	930398469
Location:	

Name	Marion Stoddart
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	WE ARE ALL CONNECDTED
Comments:	I oppose the present practice of mosquito control in the Commonwealth of Massachusetts because it is ineffective, harmful to people and other forms of life including pollinators and fish and that we citizens of Massachusetts are being forced to pay to poison ourselves and our environment against our will. I applaud the formation of the Mosquito Task Force to develop a science base ecological mosquito management plan to present to the Legislature next year to follow the best available science in crafting a new policy. I have spent most of my life (I'm 93) working to protect our environment from pollution by helping to et federal state and local legislation passed to abate pollution and to restore healthy rivers for water supply wildlife habitat and recreational use. I do not want poisonous mosquito spray used contaminating our waters, destroying our wildlife including fish, amphibians and the pollinators we depend upon to fertilize our plants and provide food for humans, birds and other.fellow inhabitants. of this world. I am appalled that PFAS is one of the spray ingredients. We are ALL connected!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 3:08 pm
Browser:	Chrome 98.0.4758.80 / Windows
IP Address:	204.167.92.26
Unique ID:	930402053

Name	wendy robinson
Organization:	Cambridge DPW
Affiliation	Government
Subcommittee to which your comment pertains	Policy Structure
File	https://massgov.formstack.com/admin/download/file/12250580197

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 3:19 pm
Browser:	Firefox 97.0 / Windows
IP Address:	209.6.170.166
Unique ID:	930406660

Name	Ruth Rin
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Urgint Rejection of Aerial Spraying

Comments:

Testimony to MCTF (Mosquito Control Task Force)

As an elderly resident living in Massachusetts I have medical documentation from the Lahey Clinic that I have been chemically injured by pesticides. I write to inform the Task Force of the very real health risks from pesticide sprayed either by truck or by aerial methods.

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As a recommended remedy to this study deficiency, a MCTF Subcommittee voted against a MCTF member's request for expert testimony on harm to human health by pesticides. Why? Studies such as Dr. Claudia Miller's University of Texas Health Science Center research study showing a connection between pesticides and mast cell disorder and others were all repeatedly and summarily dismissed by the MCTF.

Because of this lack of due process, the effects on vulnerable populations (elderly, children, pregnant women, asthmatic and chemically injured) went unaddressed. This needs to be addressed and rectified as soon as possible.

There are numerous other studies documenting harm from pesticides which I would be happy to provide. Thank you.

Respectfully submitted,

Ruth A. Rin

Burlington, MA

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 3:35 pm
Browser:	Mobile Safari 12.1 / iOS
IP Address:	72.74.63.126
Unique ID:	930413100
Location:	

Name	Bridget MacDonald
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Contamination
Comments:	Please follow "first do no harm". Poison to the life forms is not the solution. The practices being followed poison life and alter eco systems and biomes. You can't even fathom all the pico sized reactions and it's making a mess. As well, you have to many mistakes and inadequate testing. Please look at all the variables your decisions are altering in nature downstream in the cascades of life and consider the trillions of variables our limited perspective of life can't see, with an ounce of respect if at all. Best practice would be to stop all applications and wait until you figure out all their mechanisms in the cascade they will encounter. That will be never or until you meet the designer of nature.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 3:38 pm
Browser:	Chrome 98.0.4758.80 / Windows
IP Address:	96.89.216.241
Unique ID:	930414528

Name	Christopher Michaud
Organization:	Town of Dartmouth Health Department
Affiliation	Government
Subcommittee to which your comment pertains	N/A: General Comment

Comments:

February 14, 2022

Mosquito Control for the Twenty-First Century Task Force
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Members of the Mosquito Control for the Twenty-First Century Task Force:

I appreciate the chance to provide comment regarding some of the recommendations deriving from Mosquito Control for the Twenty First Century Task Force (MCTF).

First, I would like to note that I serve the Town of Dartmouth, a municipality within Bristol County Massachusetts that is served by the Bristol County Mosquito Control Project (BCMCP). The Town of Dartmouth has worked closely with BCMCP on a wide range of services across the town. It shall be noted that Dartmouth is the municipality with the largest land area in Bristol County, and one of the largest land areas in the state. With such a large municipality along the coast, the residents of Dartmouth receive a wide range of services from BCMCP including public outreach, surveillance, water management, and control of adult mosquito and larva.

The aforementioned actions of BCMCP are noteworthy here in Dartmouth as we live in a part of Massachusetts where both Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV) are endemic. The occurrences of these diseases here in Southeastern Massachusetts is not without consequence to health and our daily lives. Deaths have occurred in Massachusetts from EEE and WNV, and when detection of the mosquitos with the virus increase risk, our community has strongly advised risk reduction measures such as ending outdoor activities at sunset.

I am aware that some recommendations coming from the Task Force include elimination of aerial adulticiding during an EEE health emergency. Aerial application to control the adult population is a rare but necessary tool to use when human health is at risk. Furthermore, reducing or eliminating requested ground-based ultra-low volume (ULV) adulticiding applications from residents or town and city officials is to lose a resource for the protection health and safety of our residents, particularly here in Dartmouth where we have encountered WNV.

Bristol County Mosquito Control Program has conducted their operations in Dartmouth with the utmost responsibility with comprehensive planning to protect the public health, safety and the environment. A recommendation by the MCTF to eliminate ULV adulticiding and or aerial applications during an EEE health emergency, would most certainly result in unintended

consequences to health and the environment. We have seen a proliferation of private companies offering mosquito control services in Southeastern Massachusetts. Often while I am on the road during routine business hours, I observe these private companies at work during conditions that BCMCP will not conduct ULV adulticiding, such as high winds, low temperatures and rain.

Furthermore, private companies have been observed spraying during times when human activity and non-target species activity is at the highest, unlike BCMCP that operates in the pre-dawn hours to assure best practices to protect human health, the environment and to maximize the efforts when mosquitos are most active.

The Massachusetts Department of Agricultural Resources (MDAR) is the state agency that is required to license pesticide applicators and make standards to protect the public health and environment. Consequently, MDAR has promulgated 333 CMR 2.0 – 14.00 to provide standards for pesticides throughout Massachusetts. The creation of standards by MDAR in 333 CMR 2.00 – 14.00, requires the Department to enforce the regulations. Based on my experience MDAR is not equipped nor desires to enforce their standards in the 333 CMR codes. Thus, the MCTF must recognize this deficiency and not rely upon it to safeguard against unintended consequences from elimination of adulticiding or the rare instance of aerial application to high risk areas for EEE.

Interestingly, we know that the MCTF is forming one size fits all recommendations for Massachusetts, a state with significant variations in mosquito habitat and human population density. We know that Bristol and Plymouth counties are the top two counties for the most mosquito habitat in Massachusetts. Furthermore, the habitat in these counties in Southeastern Massachusetts favors mosquito species that carry EEE. That being said, a one size fits all and banning certain mosquito control practices like occasional aerial applications during a health emergency and ULV for adulticiding may work in some counties, however, this is not well suited for Bristol and Plymouth counties with expansive wetland areas. Furthermore, these two rural counties south of Boston have been growing in population and should be expected to increase in population in the decades ahead and increase the proximity of people to the large wetland expanses.

BCMCP is a publicly funded service of the state with funding derived from local aid. The services that BCMCP administers in each community is provided through government employees. As such with any aspect of government, transparency must occur. Therefore, a comprehensive review and public input on current mosquito control practices is justified and should occur from time to time. At this time, I am unaware of factual evidence to support draconian changes to the services Dartmouth receives from Bristol County Mosquito Control Program. Bristol County Mosquito Control Program like other mosquito control districts work together with and collaborate with cities and towns to assure protection of the public health,

safety and the environment.

In closing, mosquito control districts and many state agencies work together in conjunction with member municipalities to create a comprehensive plan to control mosquito-borne diseases, and adult and larval mosquito control are proactive responses that compliment an integrated pest management plan. Let us not forget that we have seen the emergence of two mosquito borne diseases land in the United States in the Twenty First Century, and this must remind us that our public health efforts must remain adaptive and proactive and not be restrained by recommendations that are not solidly based upon fact.

Sincerely,

Christopher Michaud
Director of Public Health
Town of Dartmouth

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 3:47 pm
Browser:	Chrome 96.0.4664.110 / Windows
IP Address:	98.229.37.69
Unique ID:	930418307

Name	Jean A. Lemieux
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Best Practices
Comments:	Personal Comment regarding pesticide exposures and health effects
File	https://massgov.formstack.com/admin/download/file/12250847009

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 4:00 pm
Browser:	Chrome 96.0.4664.110 / Windows
IP Address:	98.229.37.69
Unique ID:	930424752

Name	Jean A. Lemieux
Organization:	Massachusetts Association for the Chemically Injured, Inc.
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	Best Practices
Comments:	Please replace my earlier pdf with this one. The earlier pdf had the wrong date on it. It should have read February 14, 2022 Thank you
File	https://massgov.formstack.com/admin/download/file/12250950127

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 4:12 pm
Browser:	Firefox 97.0 / Windows 8.1
IP Address:	162.200.56.164
Unique ID:	930429786

Name	Michele Colopy
Organization:	LEAD for Pollinators and the MassQuito Coalition
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Comment upon MCTF Recommendations
Comments:	Please see attached comments from the MassQuito Coalition
File	https://massgov.formstack.com/admin/download/file/12251029853

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 4:39 pm
Browser:	Safari 15.3 / OS X
IP Address:	174.242.71.135
Unique ID:	930440978
Location:	

Name	Christine Samoiloff
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Thank you for your efforts
Comments:	As a member of my local environmental committee (these comments were from our notes on the drafts), I'd like to commend the Task Force for the following ideas related to mosquito control: 1. Reducing costs to municipalities for mosquito control programs by providing a menu option of services. 2. Standardizing staffing of MC Districts, by, for example, employing an entomologist to identify mosquitoes, and a wetland biologist/permit specialist to evaluate/oversee habitat modification efforts. 3. Creation/sharing of public education materials and making them consistent (we'd love to make use of those). 4. Addressing endangered species or environments in relation to effects of pesticide applications. 5. Making sure there are no PFAS or other harmful substances in materials used to control mosquito populations. 6. A reporting system to keep track of private spraying for mosquitoes, with the aim of understanding and potentially limiting its use. These are very important suggested improvements to the current fragmented and expensive programs in place across the state. I hope legislators will incorporate them into any upcoming legislation. And I have one concern. Organic commercial farms are being considered for exemptions (great!), but there are a lot of people that grow their own food organically in seasonal gardens (I am one of them). Those growers need consideration as well. Thank you for the work you are doing in helping to improve Mosquito control in MA. Chris Samoiloff

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 4:52 pm
Browser:	Chrome 98.0.4758.82 / Windows
IP Address:	173.237.207.61
Unique ID:	930446250

Name	Martha Morgan
Organization:	Nashua River Watershed Association
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	N/A: General Comment
File	https://massgov.formstack.com/admin/download/file/12251292370

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 4:58 pm
Browser:	Safari 15.3 / OS X
IP Address:	71.174.19.17
Unique ID:	930448655

Name	Marcia Hart
Organization:	citizen nurse activist
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Comments on the Mosquito Taskforce Recommendations
File	https://massgov.formstack.com/admin/download/file/12251329314
File	https://massgov.formstack.com/admin/download/file/12251329315

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 5:18 pm
Browser:	Chrome 98.0.4758.80 / Windows
IP Address:	173.48.216.149
Unique ID:	930456045
Location:	

Name	Barbara Fossey
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Mosquito Control for the Twenty-first Century
Comments:	Please accept these comments submitted to the Mosquito Control Task Force for the Public Listening Session dated February 10, 2022. As one of approximately 5-12% of the population that has been diagnosed with Multiple Chemical Sensitivity and one who been awarded a Worker's Compensation Claim due to occupational exposures to a synthetic pyrethroid and the highly volatile and neurotoxic inactive ingredients I am very concerned about the prospect of aerial spraying of synthetic pyrethroids for Mosquito Control and lack of a recommendation for an opt-out option. The references I've seen reviewed by this Task Force that support dismissing concerns of those with Multiple Chemical Sensitivities have been cherry picked to support the position of the chemical industry as being of pyschosomatic origin and ignore more current research by respected researchers such as Dr. Claudia Miller and Dr. Anne Steinemann. As you may be aware, chemical avoidance is still the only reliable treatment for Multiple Chemical Sensitivities. If you blanket our homes and properties with aerial spraying, we risk greater health impairment, for those who are extremely sensitive, it could endanger their ability to live in their homes. It is already a terribly difficult task to find safe housing. Any plan for the greater good must include plans for the most vulnerable. Every human life is precious.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 14, 2022 10:50 pm
Browser:	Chrome Mobile 98.0.4758.87 / Android
IP Address:	162.245.140.103
Unique ID:	930539417
Location:	

Name	Mary Barnett
Organization:	N/A except Tax paying homeowner
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Pesticide Selection
Subject:	Mosquito Spraying
Comments:	We've never had a particular problem with bad mosquito infestation at our home in N. Leverett. I feel that the incidence of risk to EEE or WNV is minimal and safer steps can be taken than massive spraying. I live an an area that has recently discovered PFAS in well water, which really brings these 'forever chemicals' front and center. We have town controversy about treating our town pond with herbicides, which I'm not in favor of, so bringing in additional poisons to our environmental for a low risk pest issue seems irresponsible and reckless. As a homeowner and taxpayer here for 25 years, and spouse to an immune suppressed long term cancer patient, we feel we should be able to refuse undue environmental toxins in our area and town citizens should have a say for opting out in this matter. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 15, 2022 10:49 am
Browser:	Firefox 97.0 / Windows
IP Address:	3.215.115.7
Unique ID:	930712790

Name	Karen Krusell
Organization:	Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Coments on Selected Draft Recommendations
File	https://massgov.formstack.com/admin/download/file/12255298223

The Health Effects of Pesticides

Used for Mosquito Control

A Report By:

Citizens Campaign for the Environment
and
Citizens Environmental Research Institute

August, 2002

THE HEALTH EFFECTS OF PESTICIDES USED FOR MOSQUITO CONTROL

This report is a product of Citizens Campaign for the Environment (CCE) and Citizens Environmental Research Institute (CERI). CCE is an independent, member-supported, not-for-profit environmental organization with a mission to build citizen involvement and understanding of policies and actions designed to protect the natural environment and public health. CCE represents an active and vocal membership of over 80,000 citizens.

CERI is a not-for-profit, research and education organization with a mission to advance sound environmental science that promotes and advances progressive environmental policies, practices, and a better understanding of the link between environmental quality and a livable and healthy planet.

CCE and CERI have been actively involved in efforts to advance a better understanding of the impacts and risks associated with the widespread use of pesticides to control mosquitoes. This work gained greater urgency when West Nile Virus was first discovered in New York in 1999.

For more information or additional copies of *The Health Effects of Pesticides Used for Mosquito Control*, contact either CCE or CERI at:

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The Health Effects of Pesticides Used for Mosquito Control

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The Health Effects of Pesticides Used for Mosquito Control

What are Pesticides?

Pesticides are chemical or biological substances used to kill or repel targeted organisms. All pesticides are poisons. In many cases they are designed to impact the immune, reproductive, or nervous system of insects. Concerns exist over the safety of present day pesticides. For the purpose of this report, the focus is on health effects of pesticides that are currently used for controlling mosquito populations throughout New York.

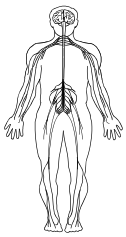
Which Pesticides are Used to Control Mosquitoes?

Four pesticides are commonly used for mosquito control. The trade names of these pesticides are:

- Scourge
- Anvil
- Permethrin, and
- Malathion.

Scourge, Anvil, and Permethrin are pyrethroid (synthetic) insecticides.
Malathion is an organophosphate insecticide.

What Should You Know About These Pesticides?



SCOURGE (active ingredient: Resmethrin) is a synthetic pyrethroid insecticide. Pyrethroids affect the nervous system. They have been linked with liver and thyroid problems and they can also interfere with the immune and endocrine systems. Scourge contains the synergist (a chemical that increases the effectiveness of the active ingredient), pipernyl butoxide, which is classified by the EPA as a possible human carcinogen.

ANVIL (active ingredient: Sumithrin) is a synthetic pyrethroid insecticide, which may affect the central nervous system.

Anvil contains 10% pipernyl butoxide. Sumithrin was shown to demonstrate significant estrogenicity in a 1999 study.[1] at the Mt. Sinai School of Medicine. This means it may promote tumor growth in cancers of the reproductive organs including breast cancer and prostate cancer.

> **1. Estrogenic and Antiprogestagenic Activities of Pyrethroid Insecticides.** ***Biochemical and Biophysical Research Communications,*** October 1998, vol.251, no.3, p.855-859.

PERMETHRIN is a synthetic pyrethroid insecticide and neurotoxin. It is more acutely toxic to children than to adults.

The US Environmental Protection Agency (EPA) has classified it as a human carcinogen and it has been shown to cause immune system damage as well as birth defects.

Note: Pyrethroids are highly toxic to fish, crustaceans, and bees. For that reason, EPA has established restrictions that prohibit their direct application to open water within 100 feet of lakes, steams, rivers, or bays.

MALATHION is an organophosphate insecticide that can cause acute and long-term neurological health problems. Malathion is being reviewed by the EPA for its potential as a low level carcinogen. It is toxic to fish and highly toxic to aquatic invertebrates and amphibians.

What are the Health Effects of Pesticides?

Health effects of pesticides can cause both **acute** and **chronic problems**. Acute health effects appear shortly after exposure to these pesticides and can include: skin and eye irritations, headaches, dizziness and nausea, weakness, difficulty breathing, mental confusion and disorientation, seizures, coma, and death. Chronic health effects may not be apparent until months or years after exposure. Such health aliments include nervous, reproductive, and immune system disorders, and cancer.

Children can be particularly sensitive to exposure to chemicals due to their small body size, immature immune systems and rapid growth cycles. Although everyone is at risk from exposure, the most vulnerable groups are children, pregnant women, the elderly, patients undergoing chemotherapy, and people with compromised immune systems.

All pesticides are associated with some risk of harm to human health and the environment. Every pesticide on the market must be registered with the Environmental Protection Agency (EPA). This registration does not guarantee the safety of the product even when used as directed. In fact, the EPA has officially stated that no pesticide can be considered safe and federal law prohibits manufacturers from making claims that EPA registration of their products means they are safe.

This paper will familiarize the reader with health effects of pesticides used for mosquito control in New York State. The following section summarizes information about the health and environmental risks that people who are exposed to pesticides face. Specific research reports and studies, as well as selected newspaper articles, support the view that further work is needed to find safe, non-toxic alternative to pesticides.

Recent Research on Pesticides, Environmental Risk and Health

1. PESTICIDES AND CHILDREN'S HEALTH

1.A. STUDY: The Five Worst Environmental Health Threats to Children's Health.

SOURCE: *Journal of Environmental Health*, May 1998, vol.60, no.9, p.46 (2).

This article contains information cited from a eport entitled "*Our Childen at Risk*" published by the Natural Resources Defense Council (NRDC, 1997) which discusses environmental exposures that threaten children's health. **Pesticides are one of the five worst threats to children's health**. The other four are **lead, air pollution, environmental tobacco smoke, and drinking-water contamination**.

According to the *Journal of Environmental Health*, "Pesticides have been associated with the development of certain cancers in children, including leukemia, sarcomas, and brain tumors. Many classes of pesticides have been shown to adversely affect the developing nervous system of experimental animals. Parental exposure to pesticides has been linked with birth defects in children. New studies suggest that pesticides may compromise the immune system of infants and children".

1.B. STUDY: Pesticides and PCBs: Does the Evidence Show That They Threaten Children's Health? Phillip J. Landrigan (Professor of Pediatrics and Director of the Center for Children's Health and the Environment, Mount Sinai School of Medicine, New York, NY).

SOURCE: *Contemporary Pediatrics*, February 2001, vol.18, issue 2, p.110 (11).

This journal article looks specifically at the impacts that toxins, such as **pesticides**, specifically **organophosphates, carbamates, and pyrethroids** can have on children.

"Organophosphates and carbamates are toxic to the nervous system,[1] and some of the pyrethroids are believed to be toxic to the reproductive system and disruptive to endocrine function."[2] Two behavioral traits associated with children's exposure to pesticides include "their hand-to-mouth behavior, which increases their ingestion of any toxic chemical in dust or soil, and their likelihood of playing close to the ground". Both of these behaviors increases childrens exposure to "toxins in dust, soil, and carpets, as well as to toxins that form low-lying layers in the air, such as certain pesticides".

1. Blondell J: "Epidemiology of pesticide poisonings in the United States, with special reference to occupational cases". *Occupational Medical State of the Art Review*, 1997; vol. 12, p.209.
2. Garey J, Wolff MS: "Estrogenic and anti-progestagenic activities of pyrethroids insecticides". *Biochemical and Biophysical Resource Communications*, 1998; vol. 251; p.855.

2. PYRETHROIDS

2.A. STUDY: Pyrethroid Insecticides: Poisoning Syndromes, Synergies, and Therapy. David E. Ray; Philip J. Forshaw.

SOURCE: *Journal of Toxicology*, March 2000, vol.38, issue 2, p.95.

This article discusses poisonings due to pyrethroids. "Two basic poisoning syndromes, Type I and Type II, are seen. Type I pyrethroids produce reflex hyperexcitability and fine tremor. Type II pyrethroids produce salivation, hyperexcitability, choreoathatosis, and seizures. Both produce potent sympathetic system activation. Local effects are also seen: skin contamination producing paresthesia and ingestion producing gastrointestinal irritation".

2.B. STUDY: Estrogen Potential of Certain Pyrethroids Compounds in the MCF-7 Human Breast Carcinoma Cell Line. Vera Go; Joan Garvey; Mary S. Wolff; Beatriz G.T Pogo.

SOURCE: *Environmental Health Perspectives*, March 1999, vol.107, issue 3, p.173 (5).

This article presents research concerning the estrogenic potential of pyrethroid compounds found in insecticides. Discussed are the potential of pyrethroids, such as sumithrin and permethrin, to disrupt normal hormone activity and influence cellular pathways.

2.C. STUDY: *OVERKILL*: Why Pesticide Spraying for West Nile Virus May Cause More Harm Than Good. William C. Sugg, III; Kim DeFeo.

SOURCE: Toxic Action Center and Maine Environmental Policy Institute, July 2001, p.1 (54). http://www.toxicsaction.org.

This report discusses how pesticides, such as pyrethroids, used for mosquito control, are not effective control agents and at the same time are harmful to human health. *"***Adulticiding, or spraying to kill adult mosquitoes, has not yet been proven effective. The Centers for Disease Control and Prevention state that ground and aerial spraying is usually the least effective mosquito control technique**[1]**"** (p.3). Also included in the report are health effects of pyrethroids such as "**asthmatic breathing, sneezing, nasal stuffiness, headache, nausea, incoordination, tremors, convulsions, facial flushing and swelling, and burning and itching sensations**" (p.9). "**Pyrethroid insecticide poisoning can be of unexpectedly long duration. Pyrethroids can produce reflex hyperexcitability and fine tremor, salivation, choreoathetosis (involuntary movements), and seizure**" (p.9). "**Several studies indicate that pyrethroids disrupt the endocrine system by mimicking the effects of the hormone estrogen, which can cause breast cancer in women and lowered sperm count in men**" (p.9).

An article from *Environmental Health Perspectives* referred to in the report concludes, *"***the specific chemicals associated with children's brain cancer were pyrethrins and pyrethroids (which are synthetic pyrethrins, such as permethrin, tetramethrin, allethrin, resmethrin and fenvalerate) and chlorpyrifos"**[2] *(p.10).* "**Northwestern University Medical School conducted a series of investigations at Northwestern's Department of Molecular Pharmacology and Biological Chemistry in Chicago, and has found neurological damage from pyrethroids**". (p.10)

1. Centers for Disease Control. Epidemic/Epizootic West Nile Virus in the Unites States: Revised Guidelines foe Surveillance, Prevention, and Control, April, 2001. http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-apr-2001.pdf

2. Pogoda, Janice M. and Susan Preston-Martin, Household Pesticides and Risk of Pediatric Brain Tumors, Environmental Health Perspectives, November 1997, vol. 105, no. 11, p. 1214-1220.

2.D. STUDY: Estrogenic and Antiprogestagenic Activities of Pyrethroid Insecticides.
Joan Garey; Mary S. Wolff.

SOURCE: *Biochemical and Biophysical Research Communications*, October 1998, vol.251, no.3, p.855 (5).

This article discusses a study of four frequently encountered pyrethroids, (fenvalerate, **sumithrin**, *d-trans* allethrin, and **permethrin**) that were tested for estrogen and progesterone agonist/antagonist activities. **The study concluded that "through hormonal pathways, exposure to certain pyrethroids may contribute to reproductive dysfunction, developmental impairment, and cancer"**.

2.E. STUDY: Pyrethroids (Pyrethrum and Permethrim): Health Effects.
(Chapter in book)

SOURCE: *Toxics A to Z: A Guide to Everyday Pollution Hazards*, John Harte et al., University of California Press; Berkley, California.

"**The EPA classifies permethrin as a possible human carcinogen on the basis of animal studies in which mice developed tumors at high dose levels**. **Allergic responses range from mild to severe skin rashes to sneezing and other respiratory problems, such as asthma, sinusitis, and bronchitis.**" (p.389).

2.F. STUDY: Chromosome/Genetic Damage Evident in Immune System Cells from Permethrin.

SOURCE: *Teratogenesis, Carcinogenesis, and Mutagenesis*, 1994, vol.14, p.31 (8).

Researchers at the National Center of Sandid Ambiental in Madrid Spain found that "**the pesticide permethrin is able to induce structural chromosome aberrations** (deformaties) **in human immune system cells as well as in the reproductive cells in laboratory animals**". As the researchers stated in the article "we can say that permethrin is a clear clastogenic (genotoxic) agent in two different cell systems".

2.G. STUDY: The Effect of Pyrethroid-based Liquid Mosquito Repellant Inhalation on the Blood-Brain Barrier Function and Oxidative Damage in Selected Organs of Developing Rats.

SOURCE: *Journal of Applied Toxicology*, 1999, vol.19, issue1, p.67 (6).

In this study, two-day-old rat pups were allowed to inhale the mosquito repellent (MR) (18 hours a day) for 8 days (postnatal days 2-9). "Rats exposed to the MR were further withdrawn from the exposure for 8 days (postnatal days 10-17) to study whether the changes induced following inhalation are reversible. **Results have shown an increased Blood-brain Barrier (BBB) permeability. This suggests a delayed maturity of the BBB system.** Brain glutathione (GSH) levels were also decreased (17%) in the exposed individuals". These and other results of this study suggest that there is a possibility of health risks, such as BBB permeability which can cause neurologicl problems, due to exposure to pyrethroids-based mosquito repellants, especially when exposure takes place at an early age.

2.H. STUDY: A Case-Control Study of Pesticides and Fetal Death Due to Congenital Abnormalities. Erin Bell, Irva Hertz-Picciotto, and James J. Beaumont. Department of Epidemiology, School of Public Health, University of North Carolina, Chapel Hill, NC. and Beaumont Epidemiology, Davis, CA.

SOURCE: *Epidemiology*, March 2001, vol.12, no.2, p.148 (9)

This study examines the effects on fetal health (or rather the effects on prevalence of fetal death) of five categories of pesticides applied in residential areas in ten California counties. These five categories are **pyrethroids**, phosphates, carbamates, halogenated hydrocarbons, and endocrine disruptors. "**The results of this study show an increased association between fetal death due to congenital abnormalities and several classes of pesticides when exposure occurs during the 3rd-8th weeks of pregnancy**". This association held true for all five categories of pesticides. There was no difference in result depending on the application method of the pesticides. (In other words, aerial and ground spraying yielded the same results). Furthermore, the risk is highest for those living within the same square mile as the pesticide application.

2.I. **STUDY: Watching the Clock**. Jeff Howell.

SOURCE:*NewScientist*, July 4,1998, vol.159, no.2141, p.49.

This article reports tests which have shown that **permethrin retains its toxic effects two years after it was sprayed.** Circulating dusts were proven to contain permethrin.

3. ORGANOPHOSPHATES

3.A. STUDY: Malathion. Loretta Brenner.

SOURCE: *Journal of Pesticide Reform*, Winter 1992, vol.12, no.9, p.29 (9).

This article examines the health effects of Malathion in human and animal studies. Malathion is detrimental because it effects the nervous system by inhibiting the enzyme, acetylcholinesterase (AchE), that breaks down acetylcholine, a chemical essential in transmitting nerve impulses across junctions between nerves. Without functioning AchE, acetylcholine accumulates to produce rapid twitching of voluntary muscles, incoordination, convulsions, paralysis, and ultimately death. Acute toxicity reactions in humans include headaches, nausea…blurred vision and pupil constriction, slowed heartbeat, respiratory depression, paralysis, coma, as well as muscular damage (after inhalation). Birth defects, reproductive problems, and genetic damage have been associated with alathion exposure in humans and animals. Furthermore, Malathion has the potential to contaminate ground and surface water. In California, five of twenty-eight county water systems tested were contaminated with malathion[1] and storm drains in Santa Clara County (where aerial sprays of malathion had been used for eradication programs) concentrated Malathion and malaoxon, eventually draining into San Francisco Bay.[2] Drift and aerial spray mosquito control programs can expose people to levels of Malathion that can cause the aforementioned health effects.

1. Howard, P.H. (ed.) 1991 Handbook of environmental fate and exposure data for organic chemicals. Volume III. *Pesticides*. Chelsea, MI: Lewis Publishers.

2. Oshama, R.J. et al. 1982. A characterization of sequential aerial Malathion applications in Santa Clara Valley of California, 1981. California Department of Food and Agriculture Environmental Hazards Assessment Program. (April.) p.12. *Cited in* Residents Against Spraying Pesticides. 1984. Environmental concerns. Unpublished report. Los Angeles, CA.

3.B. STUDY: Immune System Weakens After Malathion Exposure. University of Virginia.

SOURCE: *The Journal of Immunology*, vol.140, p.564 (7).

According to the *Journal of Immunology,* **Malathion contains chemical impurities which have been found to weaken immune system function, including a weakening of a type of white blood cell called "cytotoxic lymphocytes" (which attack cancer cells and virus infected cells).** These lymphocytes can also attack viruses in the body. Malathion has been shown to significantly weaken the cytotoxic lymphocyte's ability to perform their job effectively. Since it has been shown that people with weakened immune systems are more likely to develop encephalitis, paradoxically, it must be considered that malathion has the potential in itself to increase encephalitis cases as the spraying of malathion can weaken a person's immune system, thereby making them more vulnerable to the disease.

3.C. STUDY: Human Birth Defect Suspected from Malathion. Department of Clinical Genetics, Erasmus University, Rotterdam. Department of Child Neurology, University Hospital, Utrecht.

SOURCE: *Teratology*, 1987, vol.36, p.7 (3).

Malathion has been shown to cause birth defects in a variety of animals and at lower levels than other pesticides. Researchers suspect that Malathion caused the birth defect known as "amyoplasia", which is "a disorder characterized by almost total absence of skeletal muscle", in an infant girl who died soon after birth. The main researcher, Dr. D Lindhout, suspects this because "the mother used a malathion head lice shampoo during the 11th and 12th week of her pregnancy". Dr. Lindhout stated that malathion was a suspect in this birth defect because "when administered to adult animals, malathion and related thiophosphonates stimulate, and subsequently inhibit, the nicotinic sites in skeletal muscle, resulting in muscle weakness and paralysis. Neonates (newborn babies) are far more sensitive to these agents than adults, mainly because of a slower rate of detoxification of the metabolite (the metabolite in this case would be the liver breakdown of malathion which has been shown to be far more toxic than malathion itself)". Furthermore, "there was no genetic history of this problem in the mother or the father's family and there was no evidence of drug use by the mother", except for the use of Malathion head lice shampoo during early pregnancy.

3.D. STUDY: Intestinal Disorders in Children Born After California Spraying. Department of Preventative Medicine, University of Southern California, Los Angeles.

SOURCE: *Epidemiology*, January 1992, vol.3, p.32 (8).

This study shows evidence of harm to human health after aerial sprayings of Malathion over human populations. It was found that "children who had been exposed to Malathion during the second trimester of pregnancy were showing over two and a half times more gastrointestinal disorders (affecting the stomach and small intestines) in comparison to children not exposed to Malathion during pregnancy".

3.E. STUDY: Child Leukemia and Aplastic Anemia After DDVP Exposure. Drs. Jerry D. Reeves; David A. Driggers; Vincent A. Kiley. Department of Pediatrics, David Grant Medical Center, Travis Air Force Base, California.

SOURCE: *The Lancet*, August 8, 1981, p.300.

This study reviews the cases of seven children with bone marrow disorders that have been observed by physicians at Travis Air Force Base Medical Center in California. The physicians believe that organophosphate pesticides caused the blood disorders, in all cases. "All blood disorders occurred shortly after exposure to the pesticides DDVP/propoxur and malathion. Six of the patients had aplastic anemia and one had acute lymphoblastic leukemia".

3.F. STUDY: Poisons on Pets: Health Hazards from Flea and Tick Products[1]. David Wallinga, M.D.; MPA; Linda Greer, Ph.D.

SOURCE: *Natural Resources Defense Council*, November 2000, p.57 (74).

This report discusses children's risks to the toxic effects of organophosphates. "It is now widely accepted that among a child's developing organs, the brain - as well as the developing immune, reproductive and endocrine systems – are particularly sensitive to chemical injury". Recent studies propose the nature of adverse affects induced by organophosphate in young developing brains. "Exposure to even a single, low-level dose of organophosphates, during particular times of early brain development, can cause permanent changes in brain chemistry as well as changes in behavior, such as hyperactivity".

1. Information adapted from *Appendix A: Children's Vulnerability to Organophosphates*.

3.G. STUDY: Poisons on Pets: Health Hazards from Flea and Tick Products[1]. David Wallinga, M.D., MPA, and Linda Greer, Ph.D.

SOURCE: Natural Resources Defense Council, November 2000.

Pet products contain a number of different kinds of pesticides. This report focuses on organophosphate (OPs) insecticides, which are of greatest concern because they are designed to poison the brain and nervous system and pose many potential health effects. *Long-term effects are of particular concern for fetuses and infants, because of the OPs' possible impact on learning, behavior and other functions of the nervous system later in life. Several organophosphates in pet products also pose a risk for cancer…and emerging evidence links organophosphates exposures to the development of asthma in some people. The most common chronic complaints following OP exposure include irritability, problems with memory and concentration, muscle weakness, confusion, depression and blurred vision…these persistent symptoms can all be plausibly traced to disrupted function of the nervous system.*

1. Information adapted from Chapter 2: Health Effects of Insecticides Found In Pet Products.

4. NEWS ARTICLES

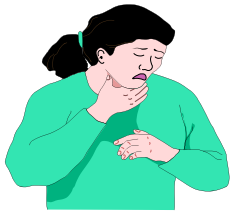
4.A. ARTICLE: "Workers Say Chemicals Used in Mosquito Spraying Made Them Ill." *Susan Saulny.*

SOURCE: *The New York Times*, January 25, 2001, Sect.B, p.2.

This article discusses the story of five men who sprayed pesticides for mosquito control for a city contractor. The exposure to the chemicals made them sick. *The men's symptoms included dizziness, difficulty in breathing, headaches, diarrhea, joint pain, and shakiness. The label for Anvil states that the pesticide is 'harmful if absorbed through the skin; avoid contact with skin, eyes, or clothing."*

4.B. ARTICLE: "Artist: I'm a Victim of Skeeter Spraying." *Michael R. Blood.*

SOURCE: *DailyNews*, September 9, 2000.
http://www.nydailynews.com/200009-09/News_and_Views/City_Beat/a-79389.asp



This article tells of how a Manhattan women ended up in the hospital after she was exposed to Anvil during a spraying for mosquitoes. *"It burned. It itched. I was coughing, I was choking…my vision is blurry. I have terrible nausea. I threw up three days in a row…"* said

the artist who lives in Inwood.

4.C. ARTICLE: "Town Probes Park's Spraying" *Jim Rogalski.*

SOURCE: *Times-Union*, Albany, New York , June 27, 2001.

This article reports on the incident where Malathion was sprayed on a ball field in Moreau, NY during a soccer game causing thirty-seven people to be hospitalized. A total of 37 youth softball players and spectators ranging in age from 6 to 52 were rushed to Glens Falls Hospital for respiratory problems from exposure to anti-mosquito fog sprayed from a truck.

CONCLUSION

This paper has illustrated the potential health effects of pesticides used for mosquito control. It has presented the documented need for policy change to find safer, non-toxic alternatives to pesticides. *Citizens Campaign for the Environment* believes that the residents of New York have a right to be protected from unnecessary environmental health risks. In order for these right to be guaranteed, all states need to move away from the use of pesticides and to find a more effective, non-hazardous way to control mosquitoes.

healthandpesticides3.wpd

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 15, 2022 5:21 pm
Browser:	Safari 13.1.2 / OS X
IP Address:	73.100.231.40
Unique ID:	930890496
Location:	

Name	Prudy Burt
Affiliation	Private Citizen
Subcommittee to which your comment pertains	N/A: General Comment
Comments:	Rachel Carson!!!!!!!!

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 17, 2022 6:11 pm
Browser:	Firefox 97.0 / OS X
IP Address:	96.230.112.135
Unique ID:	931826853
Location:	

Name	Jim Walsh
Subcommittee to which your comment pertains	N/A: General Comment
Subject:	Local choice
Comments:	I live in the very small town of Nahant, the smallest town in Massachusetts. I feel very strongly that we should have an absolute right to choose what kind of mosquito control measures IF ANY are implemented in our town. I would think that in the 21st century we would have learned about the environmental and health dangers of spraying poisons. The current crop of insecticides may not be as bad as DDT but there are proven dangers in excessive spraying, to pollinators, to children, to the immunosuppressed (as I am) and others. I am also somewhat fearful that those with a financial interest in spraying may have far to much influence in decision-making

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 18, 2022 9:52 am
Browser:	Mobile Firefox 97.0 / Android
IP Address:	96.230.124.203
Unique ID:	932050542

Name	Katrina Crocker
Affiliation	Private Citizen
Subcommittee to which your comment pertains	Best Practices
Subject:	No More Pesticides
Comments:	Pesticides have severe unintended consequences on human health and the environment, especially bees - please stop dousing us in them! Scientists have described the present day as the "insect apocalypse," "Anthropocene," and "sixth mass extinction." You can help! Please end the practice of mosquito spraying. As someone whose self and family has been impacted by thyroid disease, immune system disorders, and cancer, I implore you. Sincerely, Katrina Katrina Crocker, MCH 508-685-6797 Horticulturist Medford, MA Resources: https://www.google.com/url?q=https://www.beyondpesticides.org/assets/media/documents/mosquito/documents/citizensHealthEffectsMosqP.pdf&sa=U&ved=2ahUKEwio9NP0vIn2AhVpjYkEHRTEB0wQFnoECAYQAg&usg=AOvVaw1Y8kL_RJxQ0031ZBcOTajS
File	https://massgov.formstack.com/admin/download/file/12277906122

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 20, 2022 7:27 pm
Browser:	Firefox 96.0 / Windows
IP Address:	216.193.173.126
Unique ID:	932679519
Location:	

Name	Zara Dowling
Organization:	Conservation Commission, New Salem
Subcommittee to which your comment pertains	N/A: General Comment
Comments:	Dear Mosquito Control Task Force, I am extremely concerned about the state's handling of mosquito-borne disease management over the last several years. The policy of aerial spraying to reduce the risk of mosquito-borne disease appears to have been enacted without serious consideration of the negative ecological and potential human health effects associated with spraying, as well as without substantial public input. I live in a small town in west-central Massachusetts, where I serve on the town Conservation Commission. I would never spray pesticides on my property, and the majority of residents in our community are similarly concerned about pesticide spraying. The widespread aerial spraying of pesticides, without regard for community resident perspectives, appears to be a major violation of property rights, as well as our right to a healthy environment. This spraying also threatens Massachusetts ecosystems. Pesticides are contributing to declining pollinator populations. In Massachusetts, there are 78 endangered or rare insect species listed. Pyrethroid insecticides are toxic to pollinators and other beneficial wildlife; they also pose health risks to people. At minimum, aerial spraying should be an opt-in policy for communities, not an opt-out policy. For communities that do opt in, individual residents should still have the right to opt out for their properties. If aerial spraying is used at all, these pesticides should be limited to true public health emergencies, and these emergencies should be defined using clearly defined and quantifiable thresholds. Aerial spraying should never be used for "nuisance" mosquito control. It is shameful to require municipal government to spend staff time, volunteer time, and municipal funds to carry out "alternative" mosquito control activities at the expense of the town when the alternative option (aerial spraying) is extremely expensive and comes at the expense of taxpayers. Rather, municipalities should be provided with a toolkit of alternative mosquito control strategies and (limited) funding to carry out those activities, with expensive pesticide applications reserved for true public health emergencies, as discussed above. Thank you.

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 25, 2022 10:20 am
Browser:	Safari 15.2 / OS X
IP Address:	190.106.74.152
Unique ID:	934586688
Location:	

Name	John Portnoy
Organization:	Barnstable County Beekeepers
Subcommittee to which your comment pertains	Best Practices
Subject:	Private company spraying for nuisance mosquito control
Comments:	As a professional ecologist and hobby beekeeper I am very concerned about the rapidly growing use of mosquito adulticides by private companies for nuisance control. These companies typically promote themselves as using natural products; however, those regularly include broad-spectrum pyrethroids and a variety of "natural" but potentially toxic essential oils. Last year there were at least five companies spraying private yards on a weekly basis here in Wellfleet, with no declared health emergency. I therefore urge the Task Force to recommend strict restrictions of private-company adult mosquito control absent an officially determined health emergency. John W. Portnoy, PhD

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	February 26, 2022 7:06 am
Browser:	Chrome 98.0.4758.80 / OS X
IP Address:	108.49.216.9
Unique ID:	934897754
Location:	

Name	Christopher Sprangel
Organization:	Pantry Brook Apiary LLC
Affiliation	Commercial Association
Subcommittee to which your comment pertains	Best Practices
Subject:	How about you actually spray for mosquitoes?
Comments:	Hi there! Every summer I suffer somewhere between 300 and 400 mosquito bites, despite being doused in 40% or 100% DEET spray. Is there any possibility that you can a) make up your minds as to what to do and b) actually spray sometime before September, when a good frost will finally get them anyway. Late May/ early June might be a good time period to actually consider What a waste of tax dollars in an already high tax state.... PS - I would appreciate, as a beekeeper, a little more advertising as to when spraying in the Sudbury area will happen. Had to scramble to buy flat sheets in September to cover and protect my hives. Night spraying is great, as the bees are in their hives and protected by the sheets overnight. Since it was September, the wet sheets were cold in the morning, but was out just after sunrise to get them off and only lost a couple of the girls.. Sincerely Christopher Sprangel

Form Name:	Comments for the Mosquito Control Task Force
Submission Time:	March 16, 2022 4:16 pm
Browser:	Chrome 99.0.4844.51 / Windows
IP Address:	108.26.142.26
Unique ID:	941945460
Location:	

Name	Sally Spooner
Organization:	Taunton River Watershed Alliance
Affiliation	NGO/Community Group/Non-profit
Subcommittee to which your comment pertains	Local Engagement
Subject:	Environmentally responsible mosquito control for the homeowner
Comments:	I am a volunteer for Taunton River Watershed Alliance, Inc. and the coordinator of their Bruce Spooner Education center. We sponsor both live and Zoom presentations on subjects of importance in our watershed which is the second largest in the state. Responsible mosquito control is one of them, and we are requesting help in locating speakers. We have a live presentation scheduled for April 14, 6:30 pm at the Lakeville Public Library, Lakeville, MA We are in in Plymouth County. Is there anyone you could refer us to speak there? Locating a live speaker for that topic seems like short notice. But if a live speaker isn't available, we would welcome the opportunity to have a Zoom presentation from whomever you recommend at almost any time agreeable to both of us. Our organization is especially interested in advocacy issues, and responsible mosquito control is one of them of current interest. We would like to get out ahead of irresponsible spraying if possible. Thank you for your help with this request. Sally Spooner, TRWA volunteer