FIGHT THE BITE!

Itching to know more?

The seventh issue of "Fight the Bite" was created as a way to keep readers informed about mosquito operations in their area. NEMMC works with 32 communities in Essex County in a regional approach to control these dangerous pests. Questions on what we did in your community last year? Check out the reports tab on our website and read your BMP.

Meet *Uranotaenia sapphirina*- The "sapphire mosquito"

Uranotaenia sapphirina is a tiny, shimmering mosquito with sapphire-like stripes, found across the eastern United States, including parts of Massachusetts, see image 1. It lives in freshwater wetlands with lots of plants like cattails and duckweed. These areas provide rich food and shelter for larvae**,** which are usually seen in large numbers in sunlit spots among floating plants from mid-summer through early fall**.**

Adult females are mostly found near these wetlands. They feed at night on invertebrates, such as earthworms and leeches, and rest in shaded plants during the day. Occasionally, they may bite vertebrates, but this is rare.

This mosquito has tested positive for West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) in some studies. However, because it usually feeds on worms and leeches, it is unlikely to spread these viruses to humans or animals**.** Recent studies suggest *Ur. sapphirina* main role may be in keeping the viruses in earthworms over the winter, which could later affect birds in the spring.

Image 1. Ur. sapphirina

We proudly display our district logo, as it represents our devotion to balancing environmental stewardship and protecting residents within our District from public health issues related to mosquitos. Together we can spread the word about how NEMMC can help reduce mosquito populations in your town!

Are you on Facebook?

NEMMC is!

Find us HERE!

Mosquito & Environmental Update – Fall 2025

It's been a busy and productive year for the Northeast Mosquito Control District! Our crews worked hard to protect both people and the environment across our member communities. This season, we treated nearly 75,000 storm drains and over 850 historic breeding sites to keep mosquito populations in check and help reduce the risk of West Nile Virus (WNV). To stay ahead of salt marsh mosquitoes, we also completed three precisely timed aerial larvicide events.

Our staff stayed busy helping residents and Boards of Health, answering about 3,400 service requests for things like ULV sprays, barrier treatments at parks and schools, tire collections, and property inspections. Greenhead flies were buzzing this year—our 481 traps across the North Shore caught above-average numbers!

Environmental care remained front and center. Crews cleared 27,500 feet of ditches and 40 culverts to improve water flow, collected 280+ old tires, and began planning five wetland restoration projects for next year to support local ecosystems and reduce mosquito breeding.

On the surveillance side, 504 mosquito samples were tested for WNV and EEE. We identified 17 WNV-positive batches (no EEE this year!), representing 18% of all WNV detections statewide in 2025.

Are mosquitoes resisting?

The District has been involved in testing for resistance to our products for a number of years. To do this, we set out traps with gravid water, see image 2, designed to attract female mosquitoes. The females lay eggs, in the form of egg rafts, see image 3, on the water, and those rafts are collected for testing.

The rafts collected are brought back to the District headquarters to be prepared for shipping and testing. Single egg rafts are gently placed on a soft cushion in small petri dishes, along with a damp circle of material to keep the eggs from drying out.

The samples are then shipped to the Northeast Regional Center for Excellence in Vector-Borne Diseases at Cornell University for testing. The tests are to determine whether mosquitoes in our district are becoming resistant to the pesticides that we use. The information is used to determine whether to switch materials and when, to reduce resistance and increase the efficacy of our operations.

We test for resistance in our larvicides, *Bacillus thuringiensis israelensis (Bti)*, *Bacillus sphaericus (Bs)*, and Methoprene, and in 2025 added our adulticide, Zenivex (Etofenprox). Both *Bti* and *Bs* are biological controls that kill mosquito larvae through naturally occurring bacteria that disrupt the digestive system. Methoprene is an insect growth regulator that disrupts development, preventing the immature stages from developing into adults.

The results for 2023 and 2024 indicate that mosquitoes in our district show no resistance to our biological controls (*Bti* and *Bs*), with no to moderate resistance to Methoprene. We have not yet received the results from our 2025 submissions.

Image 2. Gravid water made in a barrel to add to traps

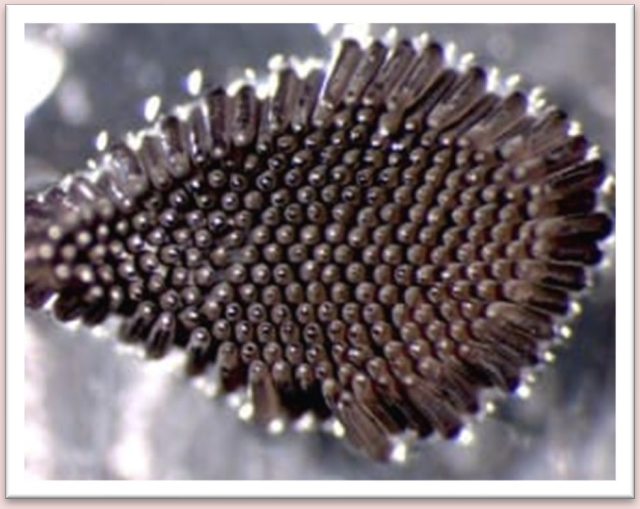

Image 3. Egg raft with multiple eggs

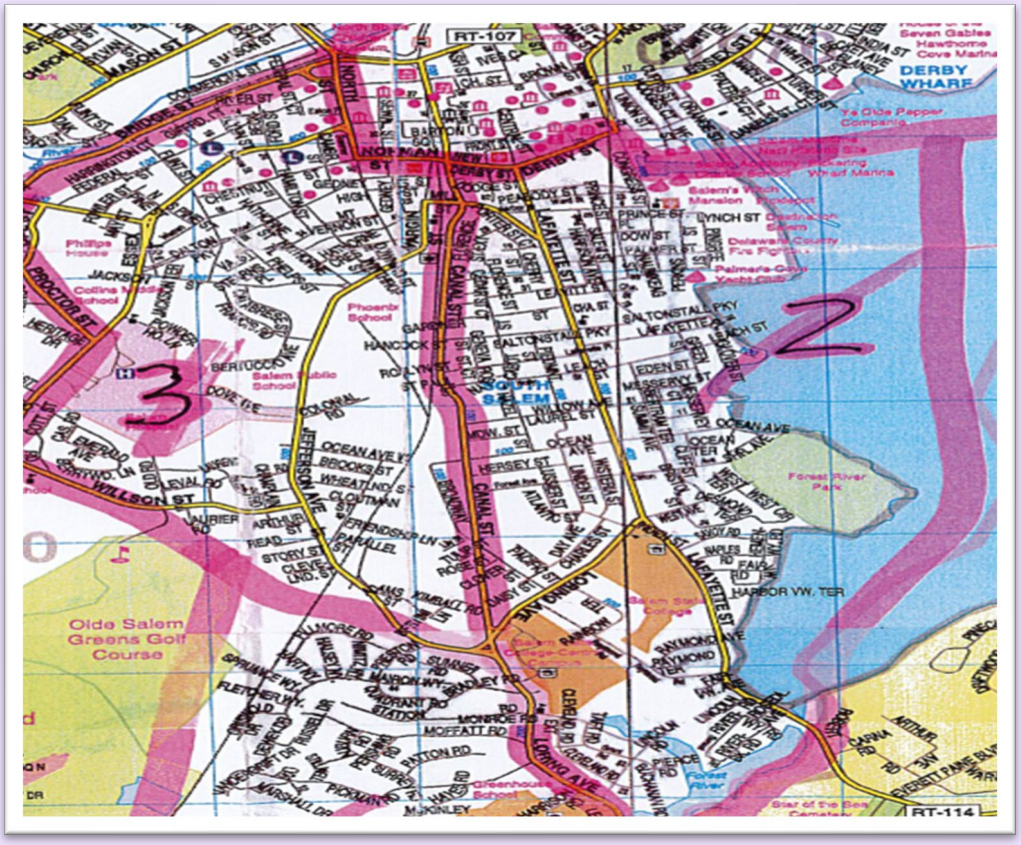

Image 3. Town split into sections

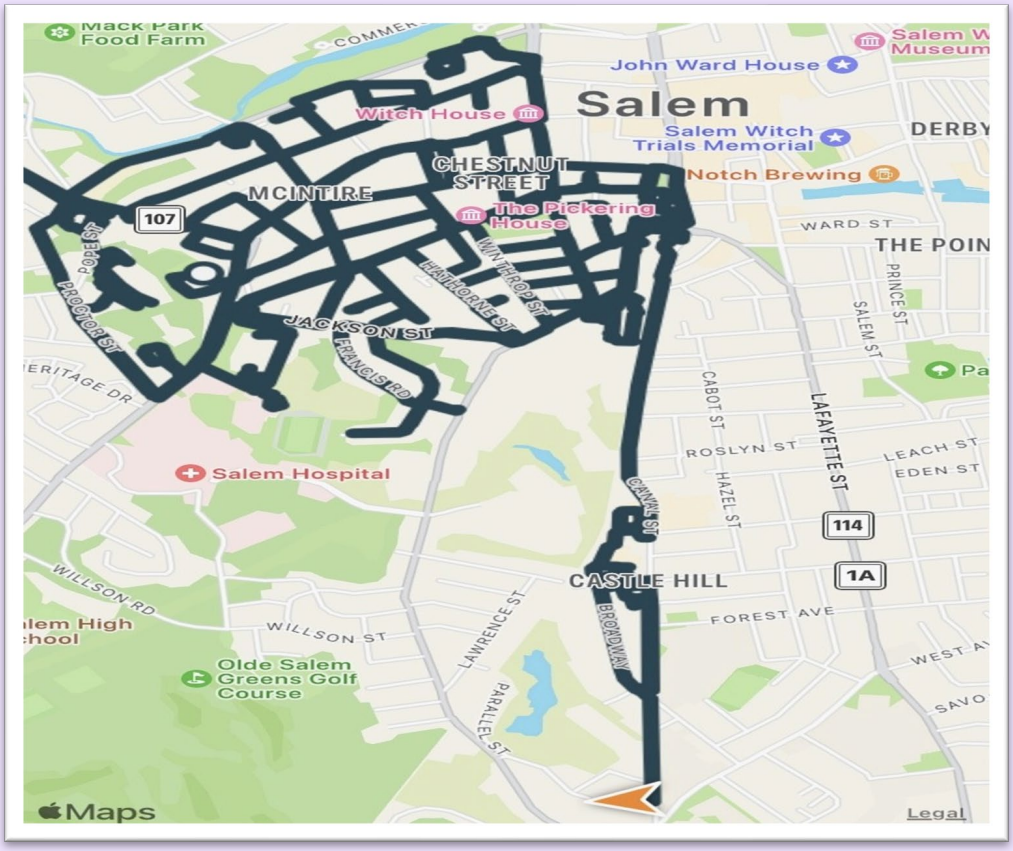

Image 4. GPS tracking assuring no street is overlooked

Catch Basins, Mosquitoes Favorite Home

When it rains, stormwater is collected from roadways into catch basins to prevent street flooding. However, these basins don't remain completely empty and dry after the rain stops. Often, they retain stagnant water mixed with leaves and debris, which makes ideal conditions for mosquitoes to lay their eggs and larvae to feed.

Starting in early summer, NEMMC staff begins treating catch basins in all district communities with a larvicide designed to stop mosquito larvae from developing into adults. Crews travel up and down every street and parking lot, treating an average of 400 to 500 catch basins per day.

Because each town and street is laid out differently, the number of catch basins varies by location. Splitting up a town into sections, see image 3, and using GPS street tracking, see image 4, helps the crew ensure the entire community is covered. Despite challenges such as construction, traffic, or hidden basins, NEMMC treated a total of **74,101** catch basins in just three months this past season.

While it's not possible to reach every single basin, treating as many as possible significantly reduces the mosquito population and the risk of mosquito-borne viruses across the district.

Rolling Light on the Marsh: How NEMMC's Specialized Equipment Protects Wetlands

When tackling larger projects in our salt marshes and wetland areas, NEMMC relies on specialized equipment designed to get the job done while protecting these sensitive environments.
Our machine is built with wide, low-ground-pressure tracks, see image 5, allowing them to move across soft, wet ground with minimal impact. In fact, these tracks spread the machine's weight so effectively that the pressure they place on the marsh is **less than** that of a person walking across it. When the wide tracks are too big for a job site, we utilize ground mats, see image 6.
This unique design allows NEMMC crews to perform important maintenance and management projects without causing long-term harm to the delicate ecosystems we're working to protect.
It's heavy equipment with a surprisingly light touch, see image 7.—helping us keep marshes healthy, resilient, and accessible for years to come.

Image 5. Specialized machine with wide base and tracks.

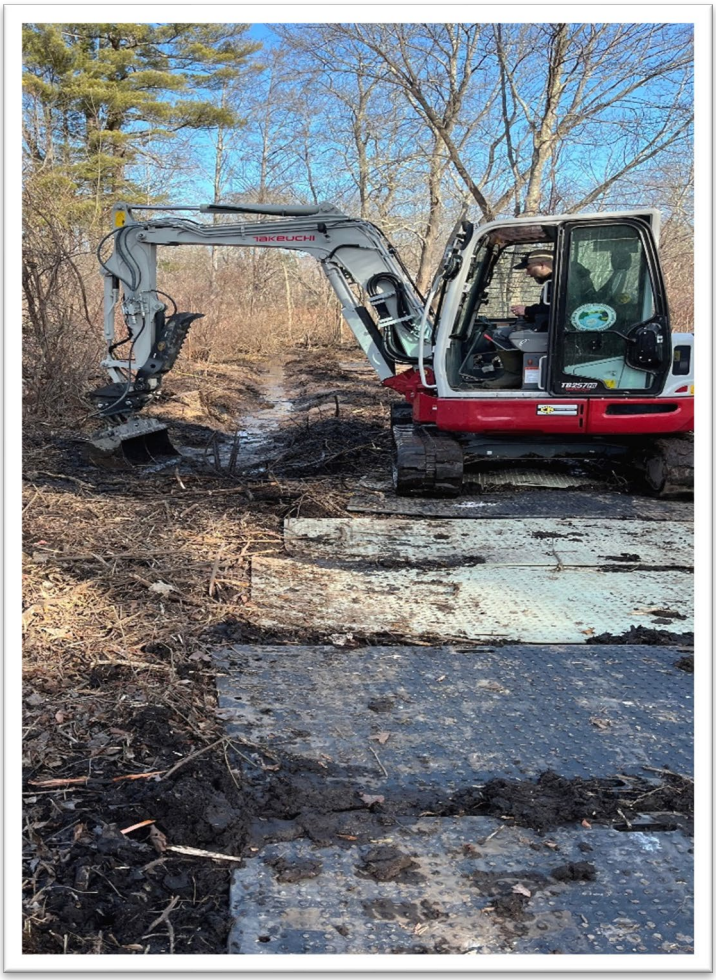

Image 6. Ground mats used to keep the area protected.

Image 7. Wide tracks on the salt marsh

Clearing the Way From Hand Tools to Heavy Duty

At NEMMC, no two seasons look the same. Our work is wide-ranging, ever-changing, and always focused on one goal: serving the communities in our district as efficiently as possible.

During the winter months, one of our key jobs is opening up blockages in trenches and swales. Why? Because when water can't flow, it creates prime breeding habitat for mosquitoes. The challenge? Many of these swales haven't been touched in years, which means lots of dense, tangled vegetation standing in our way.

In the past, staff tackled this job the old-fashioned way with hand pruners and brush cutters. It was slow, exhausting, and risky. Poison ivy, ticks, and stinging insects were just part of a day's work.

Enter the forestry mulcher. This quick-connect attachment hooks onto our excavator and chews through brush like it's nothing, see images 8 and 9. The difference has been night and day. What once took hours of sweaty, hazardous labor now takes a fraction of the time, allowing us to get more done while keeping staff safer.

Of course, boots on the ground are still essential, whether it's cutting vines the machine can't reach or keeping watch as a second set of eyes for the operator. As with any heavy equipment, safety is top priority, debris from the mulcher can travel hundreds of feet, so careful planning is a must. The bottom line? The mulcher has revolutionized how we clear brush and maintain swales. More efficiency means more projects completed and ultimately, healthier, reduced mosquito communities across our district.

Images 8 and 9. Showcasing how the mulcher can clear through blocked pathways and chew through dead trees.

Image 10. Cleared marsh area exposing vital mudflats.

Image 11. Partial clearing of the phragmites

Birds of a Feather stick Together

Mosquito control isn't just about managing pests—it also plays a role in supporting wildlife and conservation. This year, the Northeast Massachusetts Mosquito Control (NEMMC) partnered with the Friends of Parker River National Wildlife Refuge, a nonprofit organization dedicated to protecting the Parker River national Wildlife Refuge (PRNWR) through conservation projects, educational outreach, and operational support.

One of the key joint efforts focuses on water level management to improve shorebird habitat. Each summer, water levels at the Bill Forward and Stage Island impoundments are gradually lowered exposing mudflats that provide vital foraging grounds for migrating shorebirds, see image 10.

Once the habitat is prepared, NEMMC steps in to manage invasive phragmites (Phragmites australis), a common reed that can grow up to 20 feet tall and crowd out native vegetation. Using a PistenBully 100 flail mower, we cut back the reeds to open up views of the impoundments, see image 11. The effort not only improves habitat quality but also enhances the experience for visitors, birdwatchers, see image 12, and conservationists who come to observe the rich diversity of shorebird species.

This collaboration highlights how mosquito control and conservation can go hand in hand—supporting the residents of our district and the health of local ecosystems.

Image 12. Viewing access at PRWR.