



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!

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**NEMMC is!**

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# FIGHT THE BITE!

## Itching to know more?

The second issue of “Fight the Bite” was created as a way to keep readers informed about mosquitoes in their area. NEMMC works with 32 communities in Essex County in a regional approach to control these dangerous pests. If you happen to see our technicians out in your backyard, wave and say hello. We are always happy to stop, chat and answer any questions. Most importantly, don’t forget to wear repellent when outdoors.

## IT Bytes

As we continue to move forward, one of our goals was to increase our efficiency by upgrading our hardware and software. In 2021 NEMMC provided all employees with iPhones, ensuring the equipment used will keep up with our Field Seeker program updates.

Over the winter we upgraded our field tablets to the MesaPro. These tablets are used with the Field Seeker software for adulticiding and other operations, see Image 1. These tablets are used with the [FieldSeeker software](#) for adulticiding and other operations. The larger 10” screen, make it easier for the crew to map areas of concern or work done on wetlands projects while in the field. Having the tablets also gives our crew another option for data collection.

We also added truck mounted weather stations, see Image 2. These will allow our field crew to make on the spot decisions about operations based on real time environmental conditions during adulticiding operations. This not only ensures we remain in compliance with all state regulations, but also gives us valuable data used to analyze other control measures relative to weather variables.

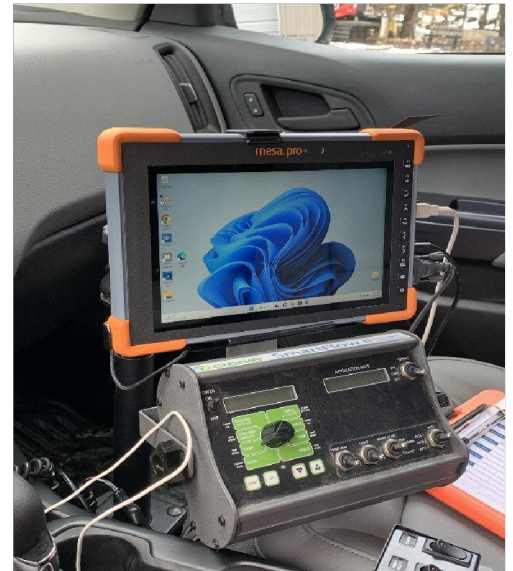


Image 1. [Mesa Pro](#) tablets installed.



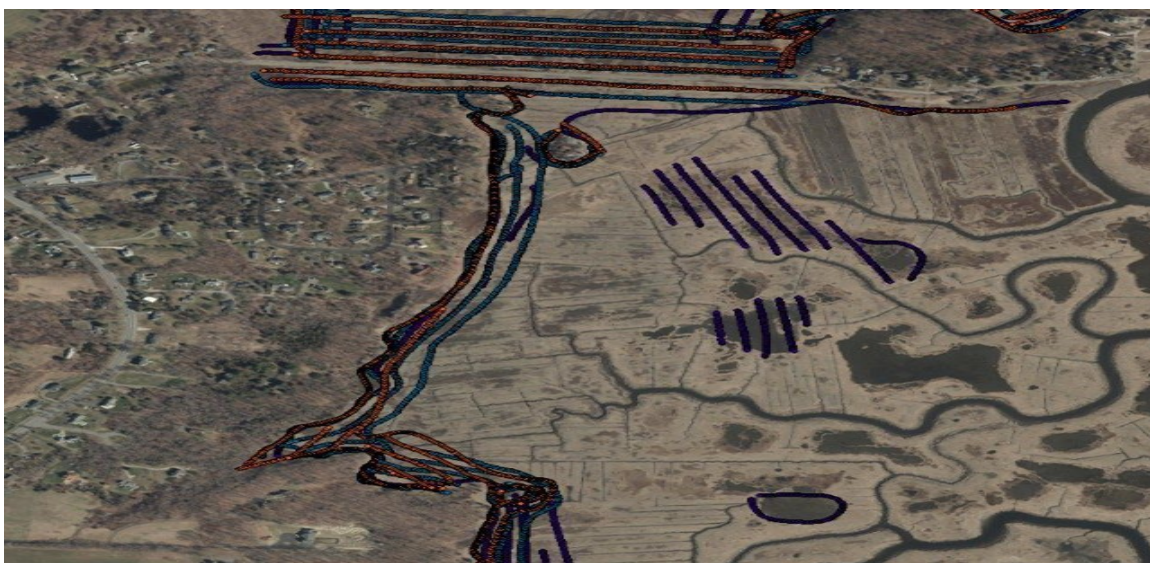
Image 2. Mounted [weather station](#).



## Just Wing It!

We're that good. What happens when you combine tracking data with the expertise of our field crews in the air? You get validation of how precise our salt marsh larviciding operations are. But more than that, we can see how mosquito populations change over the course of just one season. Our helicopter pilots use the [AgNav program](#) to track flight pattern and where larvicide is applied. Our field technicians provide input from inside the helicopter during each flight. That data is then uploaded to our mapping program and used to confirm what we see on the ground.

Image 3 shows the number of passes needed to make as the season progresses. Note that each month in the summer the tides tend to become higher. Higher tides fill the salt marsh uplands, which push mosquito larvae further back. On the days leading up to, including day of aerial applications, our field crew samples several areas checking for larvae. Image 4 has been buffered to show the extent of where the larvicide is applied with each pass showcasing the accuracy of application.



*Image 3 shows the flight pattern for each month during the summer.*

*June = Red,  
July = Blue  
August = Purple*



*Image 4 the blue area shows precisely where the larvicide was applied in July 2022.*



## Let There be Light

We currently have 40 historic mosquito trap [surveillance stations](#), see Image 5, that are reliant on household and municipal power supplies.

Although these are convenient and secure, we constantly struggle to find an electrical source when we lose a location due to a resident moving, new construction, and loss of power from storms and tripped breakers. Our goal has been to retrofit some of our current stations to renewable, dependable solar power.

Some residents who agree to power our traps are always concerned with privacy and security, the stigma of virus hits and extension cords on common areas. With the option of solar powered traps, we would have more flexibility to place traps in locations that can maximize our collections and sustain historic data without losing data to power failures, irritation to residents and site closures.

In the fall of 2022, we initiated our transition to solar by developing a mobile solar power supply prototype, see Image 6. NEMMC presented this at the annual [NMCA](#) conference in December. Solar will be implemented in 2023.



*Image 5. Surveillance trap currently supplied by household electrical power.*



*Image 6. Prototype to deliver solar power to our surveillance trap stations.*



## “Springing” into Mosquito Season

What a re-leaf! NEMMC is back out into your back yards treating mosquito breeding sites.

Spring rains and snow melt create vernal pools. [Vernal pools](#) are depressions in the land, covered by shallow water for variable periods from winter to spring, but may be completely dry for most of the summer and fall. These areas of standing water don’t last very long and are temporary spring nurseries for many different species of organisms, including those pesky spring mosquitoes.

In the spring, when our technicians go into the field, they are looking for mosquito larvae breeding in these shallow pools. The vernal pools are usually found in the woods of suburban areas. At every site encountered, technicians dip for mosquito larvae, see Image 7. Multiple dips in the same area are extremely important to determine the threshold for any larval treatment, see Image 8.

Some vernal pools will have various kinds of frogs, salamanders, and fairy shrimp, see Image 9. These organisms can control mosquito larvae in that pool by feeding on them. Pools with natural organisms tend to show that the overall mosquito larvae population is below the threshold for larvicide treatment. Sometimes, another pool just feet away will not have all these natural predators, and the mosquito larvae in a single dip may be in the hundreds. The untreated larvae create many thousands of flying biting adult females weeks later. Those are the pools that we target for larviciding and are historically sites that breed every spring.

Application of these larvicides may be by backpack or by hand, depending on the size of the woodland pool. The larvicide used contain naturally occurring bacteria ([Bacillus thuringiensis & B. spearicus](#)) that targets only the mosquito larvae that ingest it. So, birds, animals, other insects, reptiles, amphibians, fish, even your children and family pets are not harmed when encountering the treated water.



*Image 7. A field technician dipping a vernal pool for mosquito larvae.*

*Image 8. Shows an up close view of larvae found in one dip.*



*Image 9. Juvenile newts can be frequently seen in and around vernal pools.*



## Can We Dig It?

NEMMC worked with the City of Newburyport to restore an existing ditch on Malcolm Hoyt Drive.

This was the second part of a three-phase job.

Here, blockages and down trees were reducing the flow of water from an Industrial Park to a main river, see Image 10, causing storm-water flooding and creating prime mosquito breeding habitats.

The field crew used chainsaws and heavy equipment specialized with brush cutting attachments to gain access to the ditch to remove soil and debris, see Image 11.

Over 550 feet of ditch was restored to its original depth and width allowing the water to flow freely into Little River, see Image 12. Remediation of larval breeding sites is one of the many ways NEMMC can help limit mosquito populations in your community.



*Image 10. Pre-restoration*



*Image 11. Specialized Equipment*



*Image 12. Post-restoration*



## Yes, we Can!

Another winter project was at a golf course in Newbury. [Phragmites](#) and leaf debris were causing major flooding on one of the fairways, see Image 13.

Ocean tides not only effect beaches, but also rivers and streams. During high tides, the water would come up the ditch, but was blocked from draining when the tide receded, causing breeding habitat.

Our field crew mowed the phragmites and cleaned out 225 feet of ditch. With soft ground, our low ground pressure mats and machinery provided easy access to the ditch, see Image 14.

Once completed, the tide can now rise and recede without causing major flooding in the golf course and upland edges., see Image 15.



*Image 13. Pre-restoration*



*Image 14. Specialized Equipment*



*Image 15. Post-restoration*