Pioneer Valley Mosquito Control District

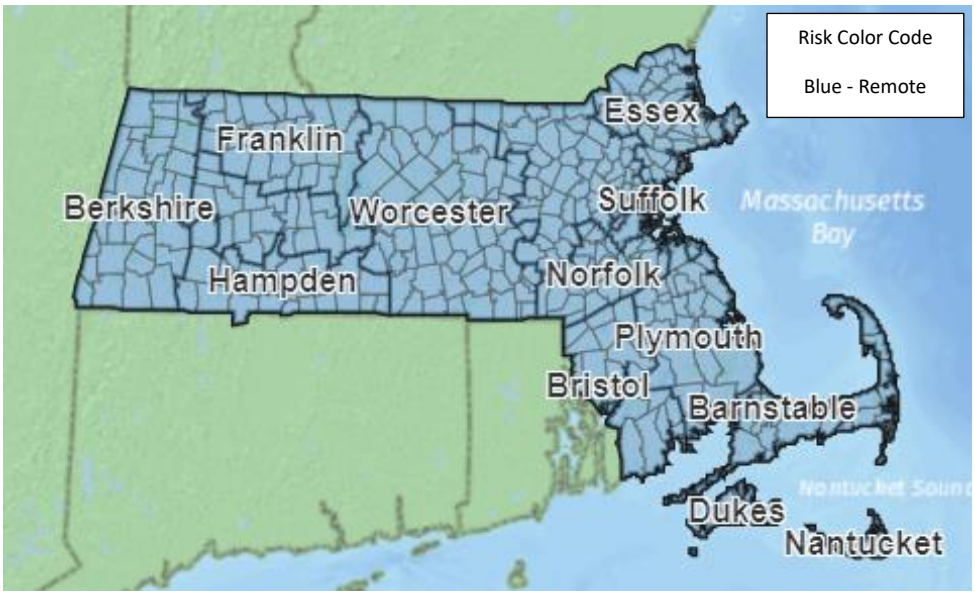
2021 Mosquito Surveillance Season Report

Shelburne

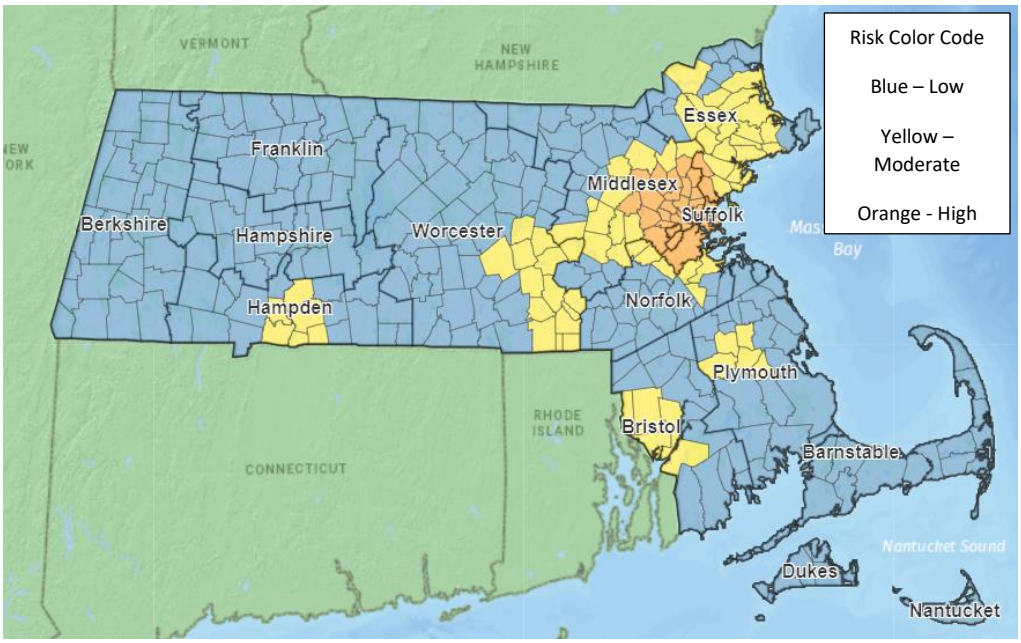
- **Summary**

  - The 2021 mosquito surveillance began the first week of June and concluded the first week of October. The DPH Testing Laboratory closed for the season on October 1st 2021.
  - The 2021 mosquito surveillance season was characterized by a moderate West Nile Virus outbreak statewide. See the statistics section for statewide results.
  - **In the Pioneer Valley, WNV was detected in Agawam, Hampden, Springfield, Hadley, Palmer, Leyden, Granville, South Hadley, and East Longmeadow.**
  - There were no EEE positive mosquitoes detected statewide in the 2021 surveillance season. Additionally, there were no confirmed human or animal cases.
  - **No EEE or WNV positive mosquitoes were detected in Shelburne in 2021.** The risk designation peaked at low for WNV and remote for EEE.

2021 EEE Risk Map



2020 WNV Risk Map



- **Statewide Results**

    - According to MDPH statistics:
        - There were 144 mosquito samples positive for WNV.
        - There were 8 confirmed human cases of WNV statewide.
            - No human cases were in the Pioneer Valley.
        - There was one confirmed animal case of WNV statewide.
        - **The PVMCD had 369 mosquito samples tested in 2021.**
        - **In the Pioneer Valley, 9 towns had positive WNV detections.**

- **2022 Season Outlook**

    - For the 2022 surveillance season, a EEE outbreak is unlikely. Past patterns show EEE outbreaks occurring in 2-3 year spans. EEE was prevalent in 2019 and 2020, but undetected in 2021. The lack of EEE in 2021 points to next season having little to no EEE. However, with very favorable conditions for EEE spreading mosquitos, the possibility does exist, particularly if the winter of 2021-2022 is mild and wet.
    - The prospect of a 2022 surveillance season with high WNV spread is more likely, especially if winter conditions are mild. Although WNV tends to spread and thrive in hot and dry summers, the widespread presence of it statewide in 2021 gives it the potential to pick right back up next summer.

- **Season Notes**
    - The 2021 surveillance season saw generally high mosquito populations across the Pioneer Valley, although mosquito counts were significantly lower in the Mohawk Valley region.
    - Gravid traps were found to be inconsistent in collecting samples compared to the CDC traps.
        - A primary goal of the next season will be to run experiments using different baits to test best efficacy. It will give us the opportunity to improve these devices.
    - There was a high amount of rainfall in the Pioneer Valley during the surveillance season.
        - For perspective, July 2021 was the wettest July on record in Massachusetts. Parts of the Pioneer Valley saw 12 inches of rain more than usual in just that month.
        - High rainfall led to the occasional mosquito trap flooding throughout the season.
        - Strong rainfall events led to the flushing of mosquito eggs followed by large rebounds in their populations as more stagnant pools of water became available.
        - Habitat at trap sites was very favorable for mosquitoes – wetlands were very saturated.
    - Temperature throughout the season was average. There were no unseasonably cold stretches of note.
    - Samples were made up of common mosquito species capable of spreading WNV or EEE. No invasive species were detected.
    - Mosquito numbers began to fall in late August but rebounded in September before the end of the season on 10/1/21.

- **Shelburne Weekly Results** (Legend on last page)

Date	Location	Trap Type	Results (Species - Pool Size)	Submitted for Testing	Results
	Shelburne Center Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
7/1 - 7/2	Mohawk Trail	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Shelburne Center Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
7/8 - 7/9	Mohawk Trail	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
7/15 -7/16	Mohawk Trail	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
			Coquillettidia perturbans - 5	**Submitted for EEE Testing**	**Negative**
7/22 - 7/23	Mohawk Trail	CDC	**Coquillettidia perturbans - 5**	**Submitted for WNV Testing**	**Negative**
	Shelburne Center Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
			Coquillettidia perturbans - 12	**Submitted for EEE Testing**	**Negative**
7/29 - 7/30	Arms Cemetery	CDC	**Coquillettidia perturbans - 12**	**Submitted for WNV Testing**	**Negative**
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
			Coquillettidia perturbans - 10	**Submitted for EEE Testing**	**Negative**
8/5 - 8/6	Mohawk Trail	CDC	**Coquillettidia perturbans - 10**	**Submitted for WNV Testing**	**Negative**
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
8/12 - 8/13	Mohawk Trail	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Mohawk Trail	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
			Coquillettidia perturbans - 21	**Submitted for EEE Testing**	**Negative**
8/19 - 8/20	Old Greenfield Road	CDC	**Coquillettidia perturbans - 21**	**Submitted for WNV Testing**	**Negative**
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
8/26 - 8/27	Mohawk Trail	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Old Greenfield Road	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
9/2 - 9/3	Mohawk Trail	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
			Coquillettidia perturbans - 5	**Submitted for EEE Testing**	**Negative**
9/9 - 9/10	Mohawk Trail	CDC	**Coquillettidia perturbans - 5**	**Submitted for WNV Testing**	**Negative**
	Shelburne Center Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
9/16 - 9/17	Arms Cemetery	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
	Arms Cemetery	Gravid	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA
9/23 - 9/24	Old Greenfield Road	CDC	Target species not captured / Pool size under 5 specimen	Not Submitted for Testing	NA

Note: DPH conducted their final day of mosquito testing on 10/1/2021.

Target Species and FAQs

Species Name	Description
Coquillettidia pertubans	While one of the most common species of mosquito in Massachusetts, it poses a threat for its noted ability to carry and spread the EEE virus to mammals. This species is often inclined to bite humans because since it prefers mammals which can lead to serious infections of EEE.
Culex pipiens/restuans complex	These two species of mosquito are also an extremely common mosquito, notable for its tendency to carry and spread West Nile Virus to humans. Culex mosquitoes are very versatile and can lay eggs in both natural habitats and artificial containers containing stagnant waters in more urban areas. Any mosquito with "Culex" in the name is a main suspect for WNV.
Ochlerotatus canadensis	Another common mosquito in Massachusetts, the Ochlerotatus canadensis mosquito is capable of spreading both EEE and West Nile Virus to humans, and resultingly, they are species of interest in our collections and DPH testing.
Culiseta melanura	This mosquito is an important factor in the EEE cycle during an outbreak. Although melanura is a bird biting species, it spreads the EEE virus between birds where they act as a reservoir for other mosquitoes to bite and potentially spread the virus to humans. Therefore, DPH usually opts to test melanura as they can be a good indicator of EEE in our environment.
Other Species	All other species captured are considered species of minimal concern usually because they do not tend to carry virus, they do not bite humans, etc.

Frequently Asked Questions	
Why don't all samples get submitted for testing?	Samples are usually only submitted if the pools (batches) of mosquitoes are made up of the species listed above, since they are our target species. Additionally, pools must be in sufficient numbers to be accepted for testing - usually 5+ mosquitoes.
What are the exact locations of the trap sites?	The exact locations of the trap sites are typically not disclosed and the locations provided are a close approximation.
What causes a trap malfunction?	In the case of a trap malfunction, a mosquito trap has failed overnight due to a wiring issue, part malfunction, etc and does not catch. Since they are exposed to the elements on a weekly basis, frequent maintenance is required but sometimes malfunctions occur.
What is a "no collection recorded"?	A "no collection recorded" means no mosquitoes were collected from a trap deployment. Usually this is caused by other insects outcompeting mosquitoes for the bait as well as unfavorable weather conditions. It tends to be more common in the early and late portions of the surveillance season.
What is a Gravid trap?	A gravid trap is one of the two main traps used by the PVMCD. It is used to catch mosquitoes that are attempting to lay eggs in its container base. This trap proves to be popular with container breeders and species capable of carrying West Nile Virus, making it useful in urban environments where container breeding mosquitoes are often found. Gravids are also effective in wetlands where natural habitat breeding mosquitos search for stagnant water to lay eggs.
What is a CDC trap?	A CDC trap is the second main trap used by the PVMCD. It is used to capture mosquitoes looking to bite and feed on an animal's blood. This trap is very effective at capturing mosquitoes across all types of species, because the trap is baited with carbon dioxide to simulate the exhalation of an animal or a human. Mosquitoes are very attracted to this carbon dioxide as they mistake it for a potential meal. These traps are often deployed in woodland environments adjacent to human occupied ares to catch mosquitoes that are searching for a blood meal that may be carrying EEE or WNV.

For any questions or comments, please contact us!

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