Pioneer Valley Mosquito Control District

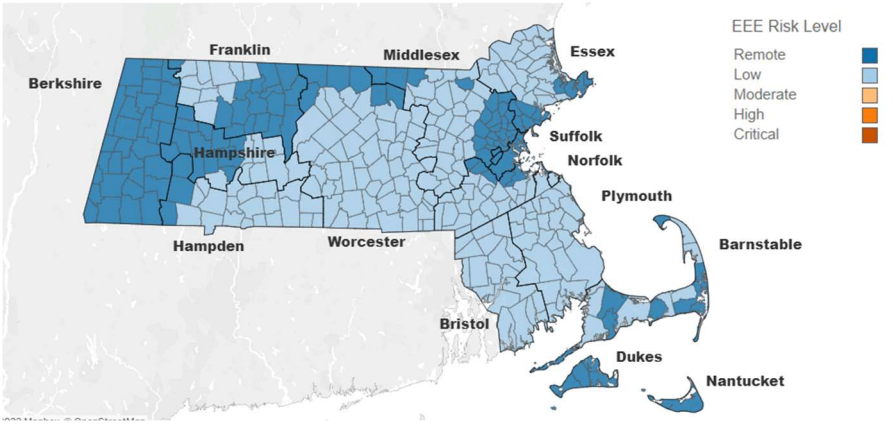
2022 Mosquito Surveillance Season Report

Shelburne

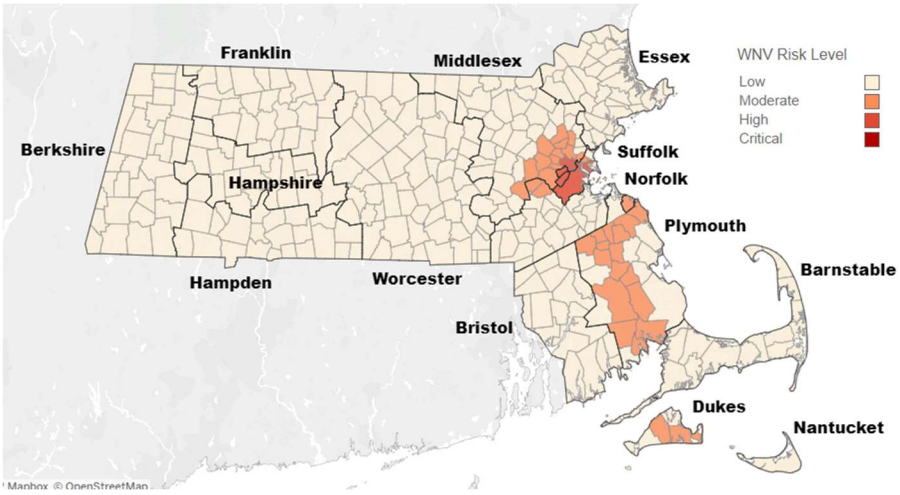
- **Summary**

  - The 2022 PVMCD mosquito surveillance season began the first week of June and concluded the last week of September. The DPH Testing Laboratory closed for the season on October 6th 2022. PVMCD concluded the season when all mosquito traps were consistently (week to week) no longer catching samples.
  - **The 2022 mosquito surveillance season was characterized by a moderate West Nile Virus (WNV) outbreak statewide. However, dry conditions contributed to a state of drought throughout Massachusetts. Limited standing water contributed to extremely low mosquito populations, particularly late in mosquito surveillance season.**
    - Most WNV positive mosquitoes and human cases were concentrated in Boston and the city's surrounding areas. This is consistent with WNV historically being more common in urban environments.
    - Drought conditions limited mosquito breeding habitat. Most trap sites were significantly drier in the 2022 season.
    - By mid-August, catches in mosquito traps became sparse. Landing capture (mosquito counts) showed an extremely low adult mosquito population throughout the District. Other districts reported sparse mosquito catches and significantly fewer service requests in 2022.
  - **In the Pioneer Valley, WNV was detected in Granville and Hadley. There were no known human or animal cases of WNV in the Pioneer Valley in 2022.**
  - There were no EEE positive mosquitoes detected statewide in the 2022 surveillance season. Additionally, there were no confirmed human or animal cases.
  - **No EEE or WNV positive mosquitoes were detected in Deerfield in 2022.** The risk designation peaked at low for WNV and remote for EEE.

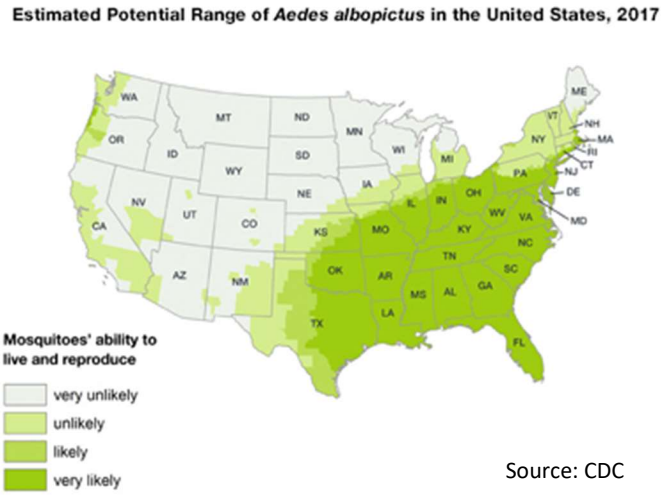
2022 EEE Risk Map



2022 WNV Risk Map



- **2022 Statewide Results**
  - West Nile Virus (WNV)
    - There were 95 mosquito samples positive for West Nile Virus statewide.
      - **2 positive mosquito samples were captured in the Pioneer Valley - detections in Granville and Hadley.**
    - There were 7 confirmed human cases of West Nile Virus statewide.
      - **No confirmed human cases in the Pioneer Valley.**
    - There were no confirmed animal cases of West Nile Virus statewide.
  - Eastern Equine Encephalitis (EEE)
    - There were no mosquito samples or human/animal cases positive for EEE statewide.
- **2023 Season Outlook**
  - The 2023 mosquito season will be largely dependent on the level of precipitation in the winter and spring leading up to the summer of 2023. Due to severe drought in the region, the 2022 season was characterized by extremely low mosquito populations.
    - If dry conditions continue, it is likely 2023 will also experience a mosquito season with limited mosquito populations. It is worth noting that WNV can continue to flourish among mosquito populations even during drought.
    - If precipitation is significant over the winter and spring, this will allow for mosquito populations to rebound in the summer of 2023, thus increasing the probability of any potential EEE or WNV outbreak. Particularly, EEE outbreak is a higher risk when there is significant precipitation.
- **The Future of Mosquito Surveillance**
  - While EEE and West Nile Virus are the primary targets for mosquito surveillance, other diseases are becoming more prevalent in Massachusetts.
    - **Jamestown Canyon Virus (JCV)** was responsible for 10 neuroinvasive disease cases in Massachusetts from 2011 to 2020.
      - MDPH will begin testing for JCV in 2023.
  - Invasive mosquito species continue to establish themselves in Massachusetts and surrounding New England states.



Source: CDC

- The **Asian Tiger Mosquito** (*Aedes albopictus*) is an invasive mosquito native to Southeast Asia that has established itself in the US and continues to spread throughout the US.
- **Asian Tiger Mosquitoes are highly competent vectors of many arboviruses**, such as WNV, EEE, Chikungunya, Dengue, Zika, among many more.
- Asian Tiger Mosquitoes are likely established in Massachusetts as they have been detected in Eastern Massachusetts and Southern Vermont. Many Asian Tiger Mosquitoes have been detected in Connecticut and Rhode Island.
- The PVMCD plans to expand surveillance program to monitor for these mosquitoes.

*Note: This map is the most recent range estimation from the CDC. Since 2017, Asian Tiger Mosquitoes have been detected in Massachusetts, Connecticut, Rhode Island, and Vermont.

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

Date	Trap Type	Trap Site	Pool Size	Species	Town	Test Type	Result
6/27-6/28	CDC	Mohawk Trail	38	Cq. perturbans	Shelburne	EEEV	Negative
						WNV	Negative
7/5-7/6	CDC	Halligon Avenue	34	Cq. perturbans	Shelburne	EEEV	Negative
						WNV	Negative
7/14-7/15	CDC	Mohawk Trail	38	Cq. perturbans	Shelburne	EEEV	Negative
						WNV	Negative
7/25-7/26	CDC	Mohawk Trail	5	Cq. perturbans	Shelburne	EEEV	Negative
						WNV	Negative
8/1-8/2	CDC	Arms Cemetery	5	Oc. japonicus	Shelburne	EEEV	Negative
						WNV	Negative
8/15-8/16	CDC	Arms Cemetery	8	Oc. japonicus	Shelburne	EEEV	Negative
						WNV	Negative
8/15-8/16	CDC	Old Greenfield road	22	Cq. Perturbans	Shelburne	EEEV	Negative
						WNV	Negative

**Note: Each community received one "bye week" throughout the mosquito surveillance season due to holiday weeks throughout the summer.*

Target Species and FAQs

Species Name	Description/Behavior	Larval Habitat	Months Active (Adults)
Coquillettidia *perturbans*	Cq. *perturbans* are one of the most abundant species of mosquito in Massachusetts and is a bridge vector for the EEE virus. *Pertubans* will feed on both birds and mammals, which is why it is considered a bridge vector.	Permanent bodies of water with emergent vegetation such at cattails.	May-September Peak: July
Culex *pipiens* and *restuans*	These two mosquito species are also very abundant in Massachusetts and are capable of amplifying WNV among the wild bird population and infecting humans.	Artificial containers such as "green" swimming pools, catch basins, discarded tires, buckets, etc. Culex species prefer foul smelling nutrient-rich water.	May-October Peak: July-August
Aedes *canadensis*	*Canadensis* is another common species in Massachusetts and considered a competent bridge vector. It can transmit both EEEV and WNV to humans.	Woodland/vernal pools.	May-October Peak: Late June
Culiseta *melanura*	*Melanura* is a primary vector for EEEV. This particular species rarely feeds on humans and prefers avian species. *Melanura* plays a significant role in amplifying EEEV among the wild bird population.	Tree root cavities covered by peat moss in red maple and cedar swamps.	May-December Peak: July-August and mid-September
Other species	There are many other species that we send into the Arbovirus Surveillance Laboratory at DPH for testing. These species are considered potential vectors or "suspects" in transmitting arboviruses. All other non-vector species are not submitted for testing.		

Frequently Asked Questions	Answers
Why don't all samples get submitted for testing	Samples are usually submitted if the pools (batches) of mosquitoes are made up of the species listed above or are deemed targeted potential vector species by DPH. Additionally, pools must be in sufficient numbers to be accepted for testing – usually 5+ mosquitoes.
What are the exact location 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 either an electrical or mechanical failure.
What is "no collection recorded" or "NCR"?	A "no collection recorded" or "NCR" means no mosquitoes were collected from a trap deployed in the field. This tends to happen earlier and later in the season; or during a significant drought period.
What is a Gravid trap?	A gravid trap is one of the two main traps used by PVMCD. The trap primarily targets "gravid" Culex mosquitoes (WNV vector) seeking out suitable habitat to lay their eggs. Culex species look for bacteria rich (foul smelling and stagnant) water to lay their eggs. The Gravid trap essentially replicates an artificial container habitat.
CDC trap	A CDC trap is the second main trap used by the PVMCD. It is used to target mosquitos that feed on mammals and are capable of transmitting EEEV or WNV to humans. The CDC trap utilizes CO2, which mimics the breath of a potential blood meal.

For any questions or comments, please contact us!

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