

2021 Vermont Mosquito Surveillance Report

Vermont Agency of Agriculture, Food & Markets

The Vermont Agency of Agriculture, Food & Markets conducted its annual statewide surveillance of mosquitoes from June 14 through October 16, 2021 (18 weeks), tracking West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) presence in the state. Mosquitoes were collected from 96 permanent trap locations in 82 towns within all of Vermont's 14 counties.

Two types of traps were used: resting box traps (RBTs) and reduced CDC light traps (CDCs). Resting box traps target the main mosquito vector (transmitter) of EEE. Reduced CDC light traps were co-located with resting box traps at wetland locations and were used as a sensing tool for mosquito species and abundance in the area. Collections were made weekly and processed at the Vermont Agricultural and Environmental Laboratory (VAEL) in Randolph Center. The collections were identified to species and known or suspected primary and secondary vector species were pooled into vials of 1 to 50 mosquitoes. The mosquito pool samples were processed at the Centers for Disease Control and Prevention (CDC) in Fort Collins, Colorado for arbovirus testing. Mosquito arbovirus testing is typically conducted at the Vermont Department of Health Laboratory, but due to COVID-19 testing taking priority, mosquito samples were shipped overnight to the CDC for testing.

In addition to routine WNV and EEE surveillance, surveillance for the Asian Tiger Mosquito (*Aedes albopictus*, the mosquito species known to vector dengue, chikungunya, and yellow fever in areas of endemic presence, and suspected to be a weak vector species for Zika virus) was conducted at 18 sites throughout southern Vermont. Two BG-Sentinel trap locations and 16 oviposition trap locations were surveyed for 18 and 10 weeks, respectively.

2021 At-A-Glance Vermont Mosquito Arbovirus Data

- 80,115 mosquitoes collected
- 1,668 mosquito pools submitted for testing
- 0 mosquito pools were positive for WNV
- 0 mosquito pools were positive for EEE

Vermont Agency of Agriculture's Mosquito Surveillance Results and Trap Locations (RBT and CDC Traps), 2021

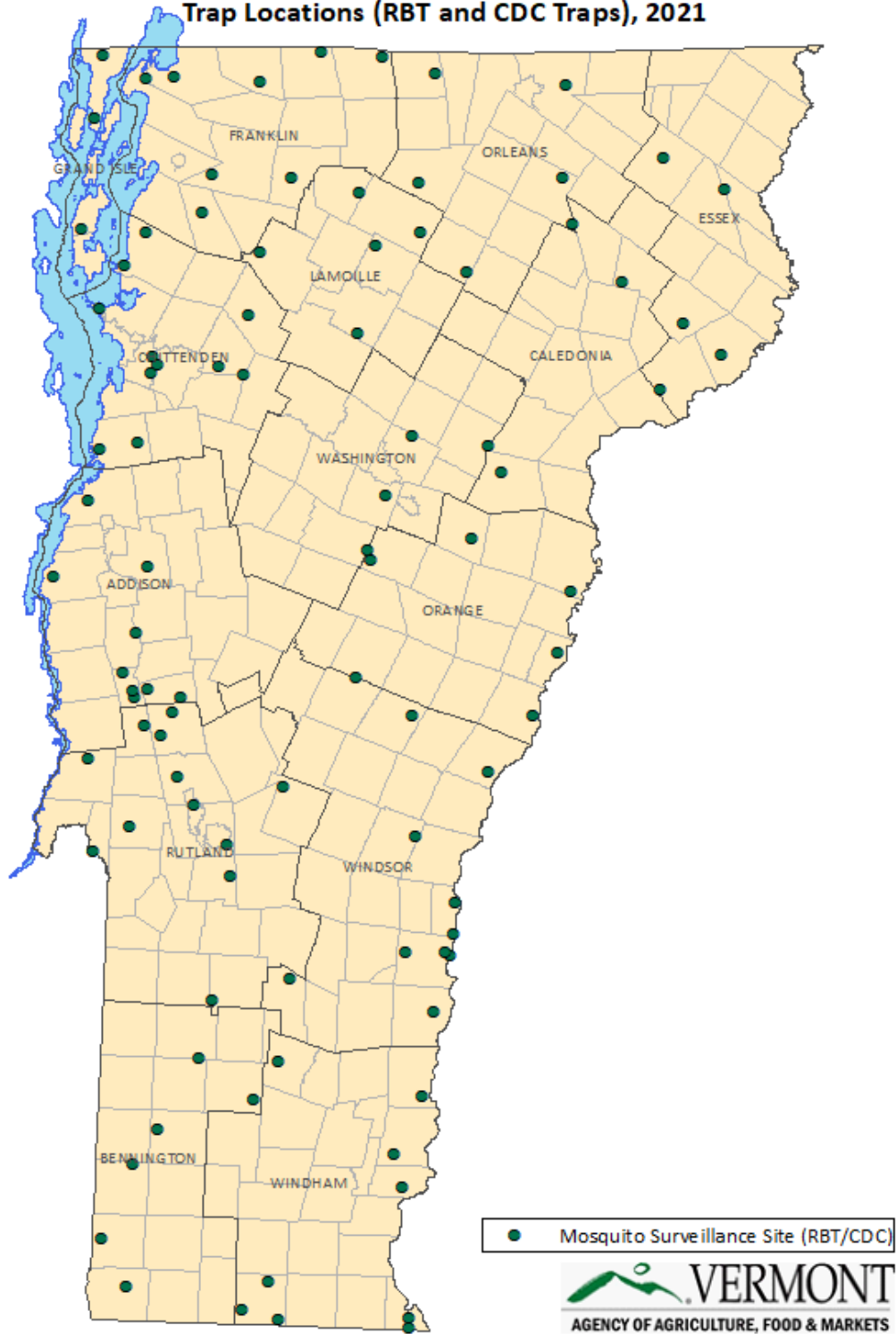


Table 1. 2021 Vermont Arbovirus Testing Results (Vermont Agency of Agriculture)

| CDC Week # | Beginning Sunday | Pools Tested | EEE+ Pools | WNV+ Pools |
|--------------|------------------|---------------------|------------|------------|
| 24 | 13-Jun | 82 | 0 | 0 |
| 25 | 20-Jun | 104* | | |
| 26 | 27-Jun | 159 | 0 | 0 |
| 27 | 4-Jul | 149 | 0 | 0 |
| 28 | 11-Jul | 157 | 0 | 0 |
| 29 | 18-Jul | 148 | 0 | 0 |
| 30 | 25-Jul | 149 | 0 | 0 |
| 31 | 1-Aug | 119 | 0 | 0 |
| 32 | 8-Aug | 154 | 0 | 0 |
| 33 | 15-Aug | 131 | 0 | 0 |
| 34 | 22-Aug | 139 | 0 | 0 |
| 35 | 29-Aug | 81 | 0 | 0 |
| 36 | 5-Sep | 86 | 0 | 0 |
| 37 | 12-Sep | 52 | 0 | 0 |
| 38 | 19-Sep | 62 | 0 | 0 |
| 39 | 26-Sep | 25* | | |
| 40 | 3-Oct | 33* | | |
| 41 | 10-Oct | 27* | | |
| Total | | 1,668 (189*) | 0 | 0 |

*not tested (will be tested in 2022 for historical records)

Table 2. 2021 Vermont Towns Trapped (n=82) (Vermont Agency of Agriculture)

| Town | County |
|--------------|------------|
| Addison | Addison |
| Alburgh | Grand Isle |
| Bakersfield | Franklin |
| Barton | Orleans |
| Belvidere | Lamoille |
| Bennington | Bennington |
| Benson | Rutland |
| Berkshire | Franklin |
| Berlin | Washington |
| Bolton | Chittenden |
| Brandon | Rutland |
| Brighton | Essex |
| Brookfield | Orange |
| Burke | Caledonia |
| Cambridge | Lamoille |
| Castleton | Rutland |
| Charlotte | Chittenden |
| Colchester | Chittenden |
| Concord | Essex |
| Cornwall | Addison |
| Craftsbury | Orleans |
| Danby | Rutland |
| Derby | Orleans |
| E Montpelier | Washington |
| Eden | Lamoille |
| Fair Haven | Rutland |
| Fairfax | Franklin |
| Fairfield | Franklin |

| Town | County |
|-------------|------------|
| Fairlee | Orange |
| Ferdinand | Essex |
| Ferrisburgh | Addison |
| Franklin | Franklin |
| Grand Isle | Grand Isle |
| Groton | Caledonia |
| Highgate | Franklin |
| Hyde Park | Lamoille |
| Jay | Orleans |
| Jericho | Chittenden |
| Killington | Rutland |
| Leicester | Addison |
| Londonderry | Windham |
| Lowell | Orleans |
| Lunenburg | Essex |
| Manchester | Bennington |
| Marshfield | Washington |
| Milton | Chittenden |
| Morristown | Lamoille |
| New Haven | Addison |
| Newbury | Orange |
| Norwich | Windsor |
| Orange | Orange |
| Pittsford | Rutland |
| Pownal | Bennington |
| Proctor | Rutland |
| Putney | Windham |

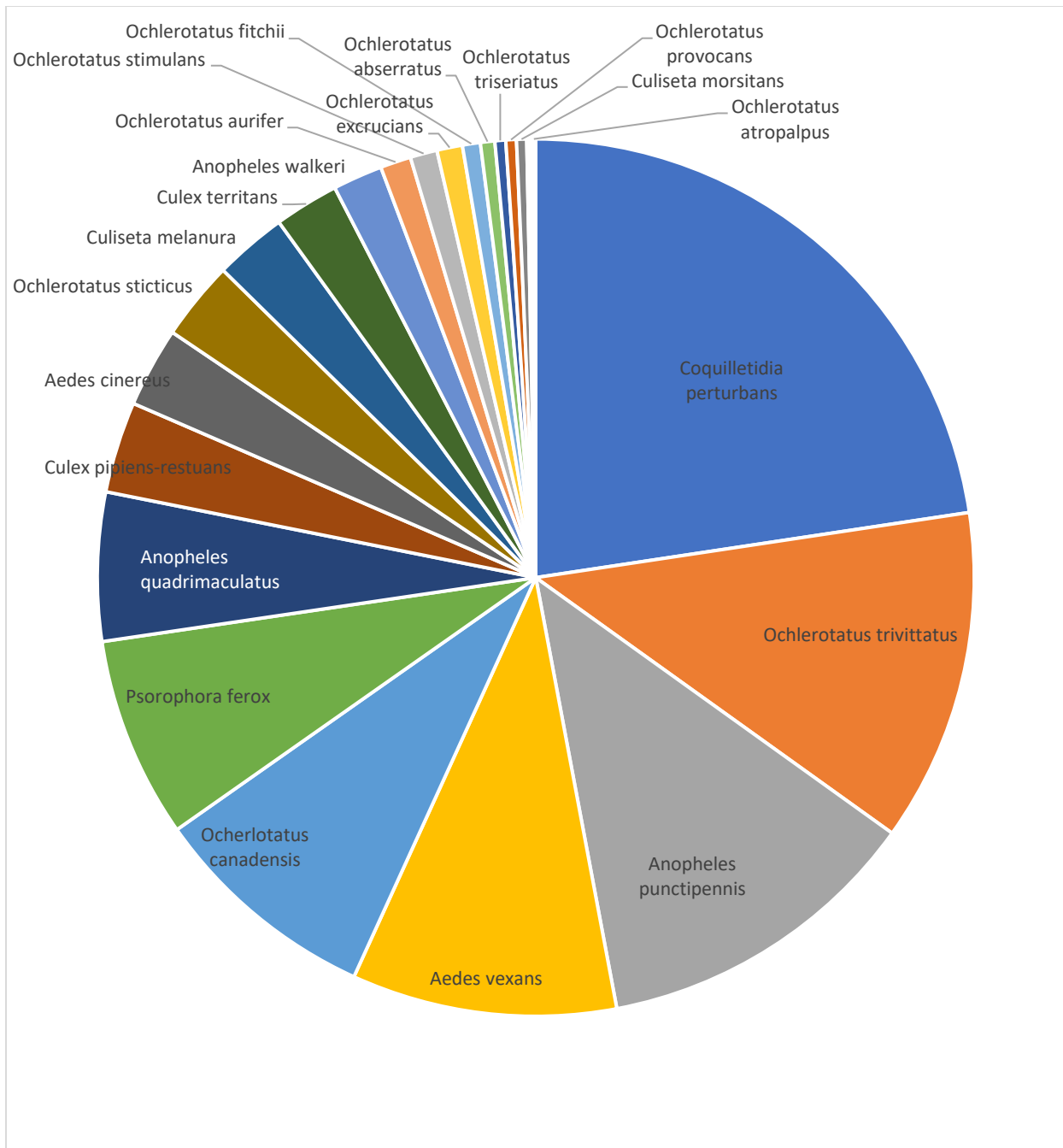
| Town | County |
|---------------|------------|
| Randolph | Orange |
| Richford | Franklin |
| Rockingham | Windham |
| Royalton | Windsor |
| Rutland | Rutland |
| S Burlington | Chittenden |
| Shaftsbury | Bennington |
| Shrewsbury | Rutland |
| Springfield | Windsor |
| Stratton | Windham |
| Sudbury | Rutland |
| Sunderland | Bennington |
| Sutton | Caledonia |
| Swanton | Franklin |
| Thetford | Orange |
| Underhill | Chittenden |
| Vernon | Windham |
| Victory | Essex |
| Weathersfield | Windsor |
| Westminster | Windham |
| Weston | Windsor |
| Whiting | Addison |
| Whitingham | Windham |
| Williamstown | Orange |
| Williston | Chittenden |
| Windsor | Windham |
| Woodstock | Windsor |

2021 Vermont Mosquito Species Statistics (Vermont Agency of Agriculture)

Table 3. 2021 Mosquito Species Collected and Tested for WNV and EEE

| Species | Number Collected | Collected (% of total) | Number Tested for WNV and EEE | Tested for WNV and EEE (% of total) |
|----------------------------------|------------------|------------------------|-------------------------------|-------------------------------------|
| <i>Coquilletidia perturbans</i> | 18,126 | 22.62 | 15,576 | 64.32 |
| <i>Ochlerotatus trivittatus</i> | 9,833 | 12.27 | 0 | 0.00 |
| <i>Anopheles punctipennis</i> | 9,726 | 12.14 | 0 | 0.00 |
| <i>Aedes vexans</i> | 7,825 | 9.77 | 0 | 0.00 |
| <i>Ochlerotatus canadensis</i> | 6,771 | 8.45 | 4,172 | 17.23 |
| <i>Psorophora ferox</i> | 5,937 | 7.41 | 0 | 0.00 |
| <i>Anopheles quadrimaculatus</i> | 4,383 | 5.47 | 0 | 0.00 |
| <i>Culex pipiens-restuans</i> | 2,693 | 3.36 | 1,987 | 8.21 |
| <i>Aedes cinereus</i> | 2,361 | 2.95 | 0 | 0.00 |
| <i>Ochlerotatus sticticus</i> | 2,335 | 2.91 | 0 | 0.00 |
| <i>Culiseta melanura</i> | 2,144 | 2.68 | 2,144 | 8.85 |
| <i>Culex territans</i> | 1,909 | 2.38 | 0 | 0.00 |
| <i>Anopheles walkeri</i> | 1,467 | 1.83 | 0 | 0.00 |
| <i>Ochlerotatus aurifer</i> | 907 | 1.13 | 0 | 0.00 |
| <i>Ochlerotatus stimulans</i> | 797 | 0.99 | 0 | 0.00 |
| <i>Ochlerotatus excrucians</i> | 755 | 0.94 | 0 | 0.00 |
| <i>Ochlerotatus fitchii</i> | 528 | 0.66 | 0 | 0.00 |
| <i>Ochlerotatus abserratus</i> | 424 | 0.53 | 0 | 0.00 |
| <i>Ochlerotatus triseriatus</i> | 319 | 0.40 | 0 | 0.00 |
| <i>Ochlerotatus provocans</i> | 312 | 0.39 | 0 | 0.00 |
| <i>Culiseta morsitans</i> | 299 | 0.37 | 299 | 1.23 |
| <i>Uranotaenia sapphirina</i> | 86 | 0.11 | 0 | 0.00 |
| <i>Anopheles earlei</i> | 50 | 0.06 | 0 | 0.00 |
| <i>Ochlerotatus japonicus</i> | 31 | 0.04 | 0 | 0.00 |
| <i>Culiseta minnesotae</i> | 30 | 0.04 | 30 | 0.12 |
| <i>Ochlerotatus atropalpus</i> | 25 | 0.03 | 0 | 0.00 |
| <i>Culex salinarius</i> | 19 | 0.02 | 7 | 0.03 |
| <i>Ochlerotatus diantaeus</i> | 14 | 0.02 | 0 | 0.00 |
| <i>Ochlerotatus communis</i> | 6 | 0.01 | 0 | 0.00 |
| <i>Ochlerotatus intrudens</i> | 2 | 0.00 | 0 | 0.00 |
| <i>Orthopodomyia alba</i> | 1 | 0.00 | 0 | 0.00 |
| Total | 80,115 | | 24,215 | |

Mosquito species collected in Vermont, 2021 (Vermont Agency of Agriculture)



Vermont Agency of Agriculture's Targeted *Aedes albopictus* Surveillance

Aedes albopictus (Asian Tiger Mosquito) is believed to be a potential weak vector of Zika, and a competent vector of dengue, chikungunya, and yellow fever in tropical and subtropical areas where these diseases are endemic. It has an estimated geographic range that includes southern Vermont; however, those diseases are not endemic to our area.

In 2021, 2 BG-Sentinel traps were set for 18 weeks in 2 towns on the Vermont/Massachusetts border. Additionally, 16 oviposition trap locations were surveyed for 10 weeks (June 28 – September 10). Sites were located along major truck routes at rest areas, truck stops, tire dealerships, and transfer stations, as this mosquito species is a container breeder with a preference for tires. Eggs were collected, counted at VAEL, and processed at the Massachusetts Department of Public Health Laboratory for rearing and larval identification.

Aedes albopictus mosquito eggs were found at 1 site in Rutland County for 1 week in September. *Aedes albopictus* mosquito eggs were also found at 1 site in Windham County for five consecutive weeks, from the beginning of August through the first week of September. *Aedes albopictus* had been detected for the first time in Vermont at this Windham County site in 2019.

Continued surveillance will help determine if this species is overwintering or is being annually reintroduced.

