

VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE, LAC, DENV, CHIK, ZIKV, and JCV

Prepared by Lisa M. Reed and Dina Fonseca
 Center for Vector Biology, Rutgers University
 Begin to 7 June, 2019, CDC Week 23
 Data download 12:52 pm 7 June



This New Jersey Agricultural Experiment Station report is supported by Rutgers University, Hatch funds, funding from the NJ State Mosquito Control Commission and with the participation of the Department of Health, Department of Agriculture and of the 21 county mosquito control agencies of New Jersey.

Culiseta melanura and Eastern Equine Encephalitis

SITE/Boxes	Inland or Coastal	Historic Population Mean	Current Weekly Mean	Total Tested* (Collected)	Total Pools Tested* (Submitted)	EEE Isolation Pools	MFIR
Bass River (Burlington Co.)/5	Coastal	0.07	0	3	1		
Green Bank (Burlington Co.)/25	Coastal	0.76	0	2	1		
Corbin City (Atlantic Co.)/25	Coastal	1.03	0.32	8	1		
Dennisville (Cape May Co.)/50	Coastal	3.48	0.14	7	1		
Winslow (Camden Co.)/50	Inland	2.40	nc	–	–		
Centerton (Salem Co.)/50	Inland	1.84	nc	–	–		
Turkey Swamp (Monmouth Co.)/50	Inland	0.38	0.50	25	1		
Glassboro (Gloucester Co.)/50	Inland	0.39	nc	–	–		

*Current week (in parentheses) results pending. ‡ corrected from previous week NC=no collection

Remarks: This is the first report for the 2019 season. Data for this season are being put into and held in JerseySurv, a subset of the CalSurv system. Last year in 2018, there were 14 detections of EEE among submitted mosquito pools, seven at resting box sites and seven from county-set traps. All positive pools are in the enzootic vector, *Culiseta melanura*. Five horses have tested positive for EEE; all were not vaccinated and all were euthanized. Currently in 2019, there are no detections of EEE virus in mosquito pools, horses or humans.

Statewide, 110 *Cs. melanura* from 15 pools have been tested, with no positive pools detected for an overall *Cs. melanura* MFIR of 0.0. 2483 specimens in 108 pools from 11 other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.0.

Traditional Resting Box Sites: 12 *Cs. melanura* from 3 pools have been tested, with no positive pools detected. An additional 33 *Cs. melanura* are to be tested in two pools.

Additional <i>Cs. melanura</i> trapped by counties *traps with positives indicated in BOLD UNDERLINED>					
County	Trap types*	Pools	Mosquitoes	Positives	MFIR
Cape May	GR, RB	7	63		
Ocean	CO ₂ , GR, RB	5	35		
TOTAL		12	98		

Additional County-set *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. Last year, half of the EEE detection came from such trappings. No pools have detected EEE to date from these

sites.

Horses and Humans: There have not been any reports of human illness. Last year, five horses were reported with EEE. All had either an incomplete or no vaccination history. **Horse owners are urged to make sure their horses are up to date on their vaccinations. Horse cases are known to occur through October and sometimes into November (see link below).** Other sensitive species are non-native birds, such as Ostriches/Emus and Gallinaceous birds such as pheasants of Eurasian origins.

Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

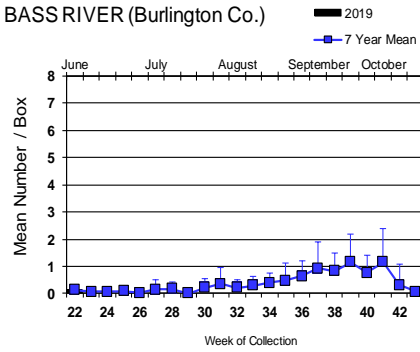
Additional Species: 11 additional species were tested for EEE. No positives were detected.

Species other than <i>Cs. melanura</i>	Pools	Mosquitoes	Positives	MFIR
<i>Aedes albopictus</i>	7	12		
<i>Aedes canadensis canadensis</i>	3	6		
<i>Aedes japonicus</i>	16	45		
<i>Anopheles bradleyi</i>	2	2		
<i>Anopheles punctipennis</i>	1	1		
<i>Anopheles quadrimaculatus</i>	3	82		
<i>Coquillettidia perturbans</i>	1	1		
<i>Culex Mix</i>	51	2273		
<i>Culex erraticus</i>	3	4		
<i>Culex pipiens</i>	4	16		
<i>Culex restuans</i>	13	32		
<i>Culex salinarius</i>	4	9		
State Total	108	2483		

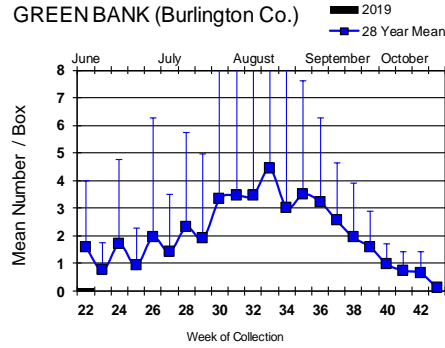
Culiseta melanura Populations

Coastal

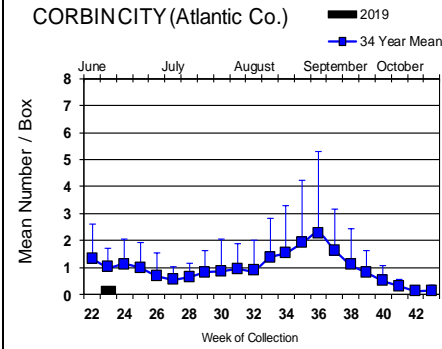
BASS RIVER (Burlington Co.)



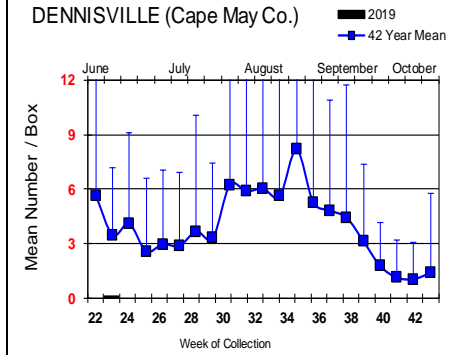
GREEN BANK (Burlington Co.)



CORBINCITY (Atlantic Co.)

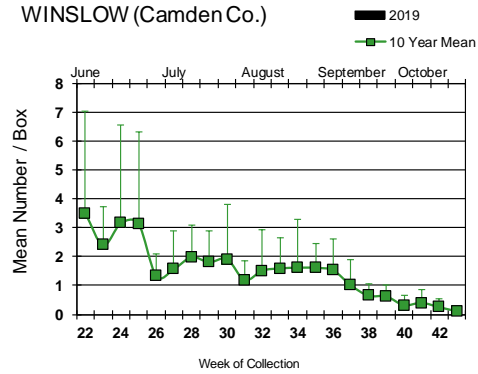


DENNISVILLE (Cape May Co.)

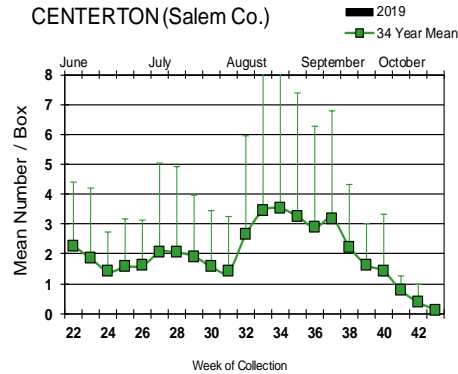


Inland

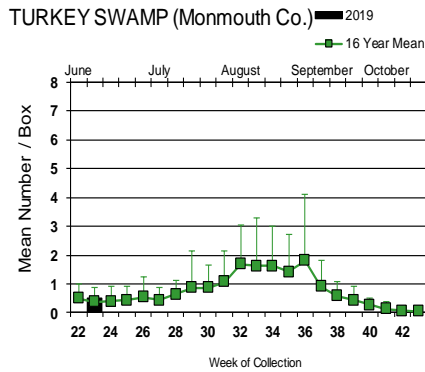
WINSLOW (Camden Co.)



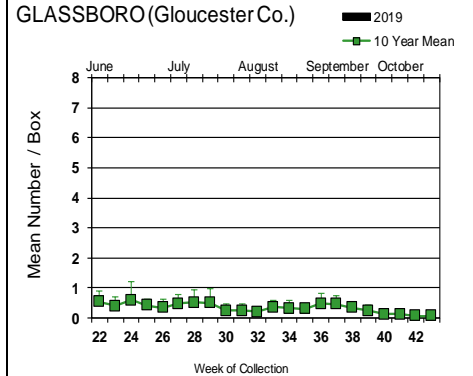
CENTERTON (Salem Co.)





TURKEY SWAMP (Monmouth Co.)



GLASSBORO (Gloucester Co.)



Resting boxes were put out at the Centerton, Glassboro, and Winslow site on 3 Jun and will start collection next week. No detections of EEE has occurred at any of the traditional resting box sites.



 = Positive pool(s) detected (red = melanura, purple = other species).

EEE in US (2019 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine: 12 (FL)
- mosquito pools:
- sentinel: 32(+1 emu, FL)
- human:

West Nile Virus Positive Organisms in US, 2019

West Nile in US (2019 cumulative cases): Single black values indicate no change from previous week. Black values / red values equals previous week/**New totals**.
 Note: Data reported by all states should be considered provisional and subject to change. Sources for this table can be found [here](#).

	Birds	Mosquito Pools	Sentinels	Horses*	Humans
Alabama					
Alaska					
Arizona	0	9	0	0	2
Arkansas					
California	1	3	0	0	0
Colorado					
Connecticut					
Delaware					
DC					
Florida			13	1	
Georgia					
Hawaii					
Idaho	0	0		0	0
Illinois	0	10		0	0
Indiana					
Iowa					
Kansas					0
Kentucky					
Louisiana					
Maine					
Maryland(+DC)					
Mass.		0		0	0
Michigan					
Minnesota					
Mississippi		1			0
Missouri		0		0	0

	Birds	Mosquito Pools	Sentinels	Horses*	Humans
Montana					
Nebraska	0	0		0	0
Nevada					
New Hampshire					
New Jersey		0		0	0
New Mexico					0
New York					
North Carolina					
North Dakota	0	0		0	0
Ohio					
Oklahoma					
Oregon	0	0	0	0	0
Pennsylvania					
Rhode Island					
South Carolina					
South Dakota					
Tennessee					
Texas		6			
Utah					
Vermont					
Virginia					
Washington	0	0		0	0
West Virginia					
Wisconsin	0	0		0	0
Wyoming					

* Can include other species (e.g., dogs, cows) reported positive.

Protocol: New Jersey Department of Health (NJDH Public Health Environmental and Agricultural Laboratories, PHEAL) and the Cape May County Department of Mosquito Control tests mosquito pools using RT-PCR Taqman techniques.

Mosquito Species Submitted and Tested for West Nile Virus through 7 June 2019

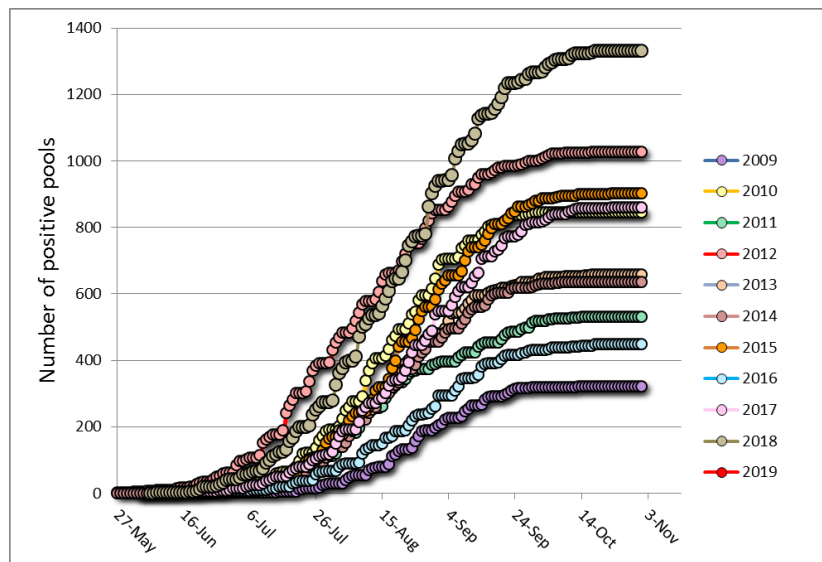
Species	Pools	Mosquitoes	Positives	MFIR
<i>Aedes albopictus</i>	7	12		
<i>Aedes canadensis canadensis</i>	3	6		
<i>Aedes japonicus</i>	16	45		
<i>Aedes triseriatus</i>	1	1		
<i>Anopheles bradleyi</i>	2	2		
<i>Anopheles punctipennis</i>	1	1		
<i>Anopheles quadrimaculatus</i>	3	82		
<i>Coquillettidia perturbans</i>	1	1		
<i>Culex</i> spp.	51	2273		
<i>Culex erraticus</i>	3	4		
<i>Culex pipiens</i>	4	16		
<i>Culex restuans</i>	13	32		
<i>Culex salinarius</i>	4	9		
<i>Culiseta melanura</i>	15	110		
Grand Total	124	2594		

Remarks: To date, 124 pools of 2594 mosquitoes from 13 species have been tested. A total of 0 positive WNV pools have been detected throughout the state. Last year was a year of significant activity, with over 1300 positive pools detected. Date of first detection in 2018 was 5 June in *Culex pipiens* from Gloucester County. Last year's patterns also included an increase in activity in the northwestern side of the state. Currently, the statewide MFIR rate for all mosquitoes is 0.0.

Humans, Horses and Wild Birds: Currently, there are no reported human cases of WNV. Last year we have over 60 cases reported, the highest to date.

Currently, there are no reported horse cases for WNV. Last year only one WNV horse case has been reported, occurring in Burlington County. This seemed rather unusual, given all the other indicators of high virus activity. For further information, see <http://www.nj.gov/health/cd/statistics/arboviral-stats/>.

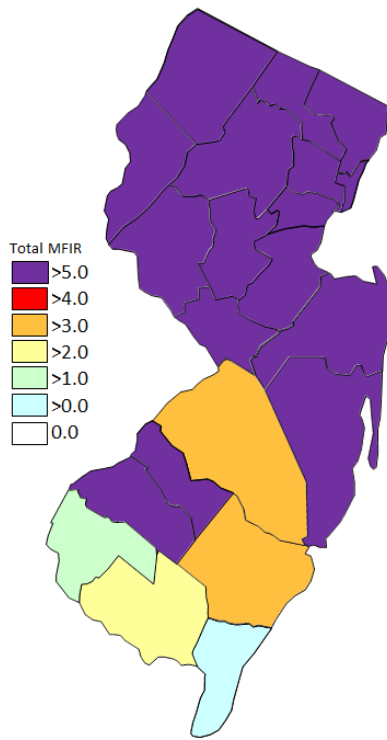
Birds are no longer routinely tested in New Jersey.



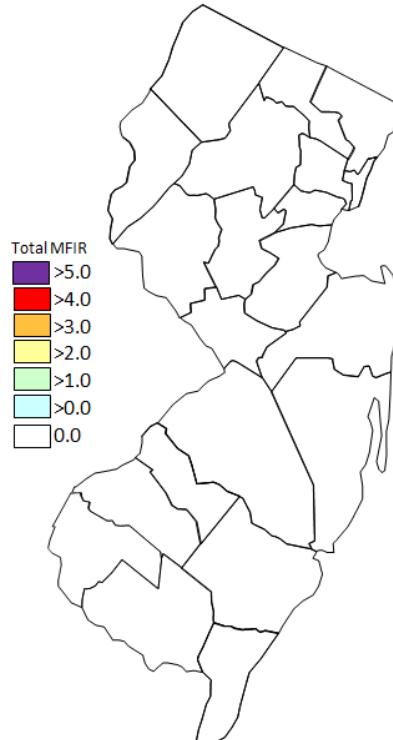
Above is a graph showing cumulative number of positive pools for the previous 10 years, inclusive of the most active (2018) and least active (2009) years. The red series represents this year and is not yet visible due to no positives detected thus far.

WNV Results by County through 7 June 2019.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		2	5		
	<i>Culiseta melanura</i>	2	5		
Cape May		50	233		
	<i>Aedes albopictus</i>	6	11		
	<i>Aedes canadensis canadensis</i>	1	1		
	<i>Aedes japonicus</i>	7	11		
	<i>Aedes triseriatus</i>	1	1		
	<i>Anopheles bradleyi</i>	1	1		
	<i>Anopheles punctipennis</i>	1	1		
	<i>Anopheles quadrimaculatus</i>	3	82		
	<i>Culex erraticus</i>	2	3		
	<i>Culex pipiens</i>	4	16		
	<i>Culex restuans</i>	13	32		
	<i>Culex salinarius</i>	3	4		
	<i>Culiseta melanura</i>	8	70		
Mercer		20	541		
	<i>Aedes japonicus</i>	7	29		
	<i>Culex spp.</i>	13	512		
Morris		12	304		
	<i>Culex spp.</i>	12	304		
Ocean		20	127		
	<i>Aedes albopictus</i>	1	1		
	<i>Aedes canadensis canadensis</i>	2	5		
	<i>Aedes japonicus</i>	2	5		
	<i>Anopheles bradleyi</i>	1	1		
	<i>Coquillettidia perturbans</i>	1	1		
	<i>Culex spp.</i>	6	73		
	<i>Culex erraticus</i>	1	1		
	<i>Culex salinarius</i>	1	5		
	<i>Culiseta melanura</i>	5	35		
Warren		20	1384		
	<i>Culex spp.</i>	20	1384		
Grand Total		124	2594		



Cumulative WNV activity in 2018.



WNV activity to 7 June 2019.

WNV activity last week, 2019

Beginning in 2019, viruses are tested as a panel, and so there may be results for species not normally associated with that virus. We have also begun testing for Jamestown Canyon virus.

Saint Louis Encephalitis (SLE) to 7 June 2019.

New Jersey will be primarily testing for SLE this year only when adjacent states show human activity (Cape May tests mosquitoes in the Cape May lab independently). SLE has had previous activity in New Jersey, most notably in 1964 and 1975 (CDC's SLE [website](#)), the latter prompting the surveillance reporting by Rutgers. SLE is a flavivirus and has a similar transmission pattern to West Nile, with *Culex* species as the predominant vectors.

No pools of SLE have tested positive for 2019. No human cases have been reported.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		2	5		
	<i>Culiseta melanura</i>	2	5		
Cape May		49	232		
	<i>Aedes albopictus</i>	6	11		
	<i>Aedes canadensis</i>	1	1		
	<i>Aedes japonicus</i>	7	11		
	<i>Anopheles bradleyi</i>	1	1		
	<i>Anopheles punctipennis</i>	1	1		
	<i>Anopheles quadrimaculatus</i>	3	82		
	<i>Culex erraticus</i>	2	3		
	<i>Culex pipiens</i>	4	16		
	<i>Culex restuans</i>	13	32		
	<i>Culex salinarius</i>	3	4		
	<i>Culiseta melanura</i>	8	70		

Mercer		20	541		
	<i>Aedes japonicus</i>	7	29		
	<i>Culex</i> spp.	13	512		
Morris		12	304		
	<i>Culex</i> spp.	12	304		
Ocean		20	127		
	<i>Aedes albopictus</i>	1	1		
	<i>Aedes canadensis</i>	2	5		
	<i>Aedes japonicus</i>	2	5		
	<i>Anopheles bradleyi</i>	1	1		
	<i>Coquillettidia perturbans</i>	1	1		
	<i>Culex</i> spp.	6	73		
	<i>Culex erraticus</i>	1	1		
	<i>Culex salinarius</i>	1	5		
	<i>Culiseta melanura</i>	5	35		
Warren		20	1384		
	<i>Culiseta melanura</i>	20	1384		
Grand Total		123	2593		

La Crosse Encephalitis (LAC) to 7 June 2019.

New Jersey will be primarily testing for LAC this year only when adjacent states show human activity (Cape May tests mosquitoes in the Cape May lab independently). New Jersey has had 3 cases of this encephalitic disease since 1964 (see CDC's LAC [website](#)). The mortality is low but like other encephalitides, LAC can have both personal (lasting neurological sequelae) and economic impacts. LAC is a bunyavirus with a transmission cycle involving mosquitoes such as *Aedes triseriatus* and small mammals such as squirrels and chipmunks. LAC can not only infect *Aedes albopictus* but transovarial transmission was also demonstrated.

(Tesh and Gubler 1975 Laboratory studies of transovarial transmission of La Crosse and other arboviruses by *Aedes albopictus* and *Culex fatigans*. American Journal of Tropical Medicine and Hygiene 24(5):876-880).

No pools of LAC have been tested yet for 2019. No human cases have been reported.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		1	1		
	<i>Aedes triseriatus</i>	1	1		
Grand Total		1	1		

Dengue (DENV) to 7 June 2019.

New Jersey will be selectively testing for DENV (including serotypes) this year. Dengue has not had a history of local transmission here in New Jersey, but each year, travelers can bring virus back from areas in the world with virus activity. This is significant as humans are NOT dead-end hosts and thus there is the potential for local transmission (i.e., New Jersey mosquitoes biting a sick person and then biting and transmitting the disease to someone else) to be established. DENV is a flavivirus but unlike WNV, *Aedes* mosquitoes are predominant vectors. In New Jersey, *Aedes albopictus* is a candidate for local transmission. There are 4 serotypes tested for Dengue.

Note Same pools of *Ae. albopictus* are tested for the four serotypes of Dengue as well as Chikungunya.

No pools of Dengue have been tested yet in 2019. There are currently 0 travel-related human cases in NJ.

County	Species	DENV1		DENV2		DENV3		DENV4		Pos.	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Grand Total											

Chikungunya (CHIK) to 7 June 2019.

New Jersey will be selectively testing for CHIK this year. Chikungunya is similar in symptoms to Dengue, a “breakbone” fever and has a low mortality rate. But this virus has had recent worldwide activity, and in the past year has come to the Western Hemisphere. As with Dengue, transmission can occur when a mosquito bites an infected human, then bites an uninfected human who subsequently becomes ill. CHIK is an alphavirus with *Aedes* mosquitoes as potential vectors. In New Jersey, *Aedes albopictus* is the mosquito of interest.

No pools of CHIK have been tested yet in 2019. There are currently 0 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Grand Total					

Zika (ZIKV) to 7 June 2019.

New Jersey will be selectively testing for ZIKV this year. Zika is an emerging arboviral threat with significant health consequences for fetuses and recent activity in the Western Hemisphere. Humans are potential hosts that can transmit through sexual activity. ZIKV is a flavivirus with *Aedes* mosquitoes as potential vectors. In New Jersey, *Aedes albopictus* is the mosquito of interest.

No pools have tested positive in 2019. There are currently 0 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Grand Total					

Jamestown Canyon (JCV) to 7 June 2019.

New Jersey will be selectively testing for JCV this year. Jamestown Canyon is a native arboviral threat with fever and meningitis or meningoencephalitis consequences. JCV is an orthobunyavirus with a number of potential mosquito vectors, including *Aedes*, *Coquillettidia*, and *Culex* species.

No pools have tested positive in 2019. There are currently 0 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		2	5		
	<i>Culiseta melanura</i>	2	5		
Cape May		1	1		
	<i>Aedes triseriatus</i>	1	1		
Mercer		20	541		
	<i>Aedes japonicus</i>	7	29		
	<i>Culex</i> spp.	13	512		
Morris		12	304		
	<i>Culex</i> spp.	12	304		
Ocean		20	127		
	<i>Aedes albopictus</i>	1	1		
	<i>Aedes canadensis</i>	2	5		
	<i>Aedes japonicus</i>	2	5		
	<i>Anopheles bradleyi</i>	1	1		
	<i>Coquillettidia perturbans</i>	1	1		
	<i>Culex</i> spp.	6	73		
	<i>Culex erraticus</i>	1	1		
	<i>Culex salinarius</i>	1	5		
	<i>Culiseta melanura</i>	5	35		
Warren		20	1384		
	<i>Culex</i> spp.	20	1384		
Grand Total		75	2362		